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ABSTRACT

The document is the third volume of a four-part report of a study conducted to evaluate and assess the state of allied health manpower clinical education and training. Four monographs focus on important issues related to clinical education as a major factor in the training of allied health manpower. In "A Critical Analysis of Methods of Ensuring Quality in Clinical Education of Allied Health Manpower," Richard G. Allen examines the educational process and how it affects the quality of the education of allied health manpower. "Feasibility of Internship Programs as an Adjunct to Clinical Education of Allied Health Manpower," by Margaret Harty, presents three alternative patterns for clinical learning which would facilitate the preparation of allied health manpower for actual practice. In "The Role of Simulation as an Adjunct to Clinical Training of Allied Health Manpower," Thomas G. Sheller and Carol J. Peterson discuss the advantages and disadvantages of simulation and suggests some applications to clinical education. In the concluding paper, "Relationships Between Nursing and Allied Health," Eileen Flynn discusses the differences and commonalities that exist between the roles of technologists and professionals and suggests a cooperative form of clinical internship for students in nursing and allied health. (EC)

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Volume III

# Monographs
# National Assessment of Clinical Education of Allied Health Manpower

(Contract NO1-AH-24345)

HEALTH RESOURCES ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE

Washington, D. C.

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This report is of a confidential nature and intended solely for the information of the client to whom it is addressed and the Task Force on Allied Health Clinical Education.

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# FOREWORD

This volume of the report consists of four monographs commissioned to explore specialized issues in clinical education. The subjects of the monographs and their authors are as follows:

- A Critical Analysis of Methods of Ensuring Quality in Clinical Education of Allied Health Manpower--Richard G. Allen
- Feasibility of Internship Programs As an Adjunct to Clinical Education of Allied Health Manpower--Margaret Harty
- The Role of Simulation As an Adjunct to Clinical Training of Allied Health Manpower--Thomas G. Scheller and Carol J. Peterson
- Relationships Between Nursing and Allied Health--Eileen Flynn

The opinions expressed are those of the authors and do not necessarily represent the thoughts of the Booz, Allen study team or the members of the Task Force.

# A CRITICAL ANALYSIS OF METHODS OF ENSURING QUALITY IN CLINICAL EDUCATION OF ALLIED HEALTH MANPOWER

Richard G. Allen

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# I. AN EXAMINATION OF CLINICAL EDUCATION

The past thirty years in the field of allied health education have been an overwhelming combination of technological advances, expansion of occupational areas, development of new programs and facilities and expansion of existing areas, and expenditure of considerable federal, state, and local monies. Legislative commissions have pointed out the manpower "shortages" in the health fields. The promoting of health careers has become a profession in itself.

As we move further into the 1970's, however, this period of rapid expansion and development appears to be experiencing difficulty. The absolute of a health manpower shortage is being challenged, and maldistribution is now a more common concern than expressed shortages. Federal funds supporting both continuing and expanded programs are being cut drastically. Paralleling this decrease in support funding is the increased cost of health care delivery, which is focusing concern on the financing and continued support of clinical education for health personnel in health care facilities, primarily hospitals. Other cost-related factors are student costs and faculty costs and those of facilities for training in proportion to their use in direct patient care service. There is also a rising critical spirit regarding the design and conduct of health care educational programs, focused on curriculum, faculty preparation, teaching methods, facilities, and other elements.

Allied health students are increasingly concerned with the quality and relevance of education they receive. The health care facilities and institutions are concerned with the ability of graduates to move into positions of responsibility without extensive periods of orientation and extended exposure to education and training. Close examination of the function of health care education, its academic base, and the reality in which academic training is translated into real life practice is both a useful and a disturbing process.

The limits of this monograph preclude a broad, in-depth examination of the entire process. Concerns will be limited to aspects of the clinical education of allied health manpower that affect its quality. Some examination of broader concerns is necessary, however, in order to put these issues in proper perspective.

There are several basic concerns in the educational process: the need to learn as thoroughly as possible the body of knowledge defined by the occupation or profession into which the student has entered; the need to learn or acquire those skills that are necessary to apply the knowledge in the health care process; and the need to assure the personal motivation of the student in the practice of his occupation or profession.

Knowledge of and by itself is useless without the skills of application and guidance of mature judgment. Ideally, the educational process should take numerous factors into account--facilitating learning by good teaching and teachers, assuring that there is provision for "feedback" of student performance for assessment by both teacher and student, and directing and encouraging students to proceed toward a state of self-assurance that is a natural outgrowth of mastery of knowledge and skills and their meaningful application in the health care process.

One element of this process, the acquisition of knowledge, is complicated by the rapid growth of knowledge in all elements of society to the extent that current graduates have a half-life of five to ten years. This means that within five years of graduation, without additional continued learning, half of what a student "knows" upon graduation has become obsolete.

It is necessary, therefore, to assure that, along with the necessary "knowledge," students are given a firm base of principles and are encouraged to develop their capacity for learning on a lifelong, continuing basis. It is questionable whether this basic concept has been incorporated into the planning of current curricula; nevertheless, it is of high urgency that it be included.

The concerns noted above call for other modifications. One, in particular, is the need for greater emphasis on learning as an active participatory process. Rote memorization and related practices are inadequate; they produce unnecessary anxiety and are basically unrealistic in terms of what the student will be expected to do once he graduates. There are students who perform with a high degree of excellence under this approach; others, who are otherwise intelligent, simply do not respond to it. We fail to account for individual differences in living styles and abilities and give only minimal recognition to the need for adapting teaching processes to individual needs and abilities.

Teaching in a participatory learning process requires, in addition to obvious modification in approach and curriculum, a flexibility on the part of faculty that is often lacking. This is equally critical in both the classroom and the clinical situation.

A number of significant concerns have been indicated to have potential or actual impact on the quality of the clinical education process. It is the intent of this monograph to present these in context and to suggest methods of dealing with them to assure a high level of quality.

Certain of these problems are common to the teaching-learning process generally, no matter what the specialized subject area; others are resultant of problems inherent in the allied health occupational areas and the special institutions in which clinical education takes place.

The first is the failure to specifically define behavioral objectives for all elements of the subjects to be taught. There is a wide range of potential errors of both omission and commission. These range from a basic failure to clearly define the occupation or the job in behaviorial objectives to a failure by instructors to teach these objectives properly or to assure the student an opportunity to be exposed to or involved in experiences that will enable him to gain mastery of objectives.

There are other potential and actual areas of weaknesses and inadequacies: inadequate number of faculty; inadequate training of faculty; inadequate preparation of those responsible for the process of curriculum development and teaching-learning; inadequate educational facilities; unbalanced teacher-student ratios; unbalanced student-patient ratios; and excessive numbers of students for the experiences available. Other areas of weaknesses and inadequacies are control and supervision problems involving the educational institutions and the clinical education institutions, inadequacy of evaluation, nonexistent faculty feedback processes, static or inelastic curricula, and artificial delimiting of occupational concerns that are not a true recognition of the reality of the current employment scene or the expectations of employing agencies. Of special interest to the health care field are the blurring or overlapping of role definitions vis-á-vis some members of the health care team, the high degree of technological change, the increasing obsolescence of various occupational areas due to the pace of technological change, the increasing fragmentation and specialization of occupational areas that were once more general, and the shifting of certain functions, usually downward, as professionals at the upper levels tend to either discard or delegate both tasks and functions to subordinate occupational levels.

The development and utilization of adequate evaluative measures is another problem area. How do we know if and when a student is adequately prepared as a practitioner, and in whose hands should responsibility for such a judgmental process rest? This process of evaluating, accrediting, licensing, approving, etc. is a maze of contradicting and overlapping jurisdictions, omissions, and misconceptions.

The picture of three levels of professional nurse preparation--validated finally by a single R.N. licensure examination for graduates of associate degree, diploma, and baccalaureate programs--is an example of this. Such a paradoxical situation cannot help but lead to confusion in terms of realistic utilization, appropriate jurisdiction, salary differentials, role expectations, and proper and adequate feedback for curriculum modification and development in terms of time, subject matter, teaching objectives, etc.

This relates, in turn, to the development of all of the allied health occupational levels--professional, technological, technical aide, etc.--and the delegation of responsibilities, functions, jobs, and titles within occupational groupings. Despite a great deal of work on the definitions of occupations and levels within occupations, there is still a considerable amount of overlap, redundancy, omission, and unrealistic teaching in programs to prepare allied health practitioners in the various areas of the health care field.

The problems are complicated by the complex interrelationship between elements of the problems, making it difficult to deal with just one aspect. The subsequent chapters of this monograph will attempt to deal with some of these elements as identifiable and isolated elements that are crucial to assuring quality in clinical education. The reader should be aware that this is to highlight these elements for the purpose of analysis. We must be continually aware of the broad complex of interrelationships within the area of clinical education for allied health personnel.

# II. THE EDUCATION PROCESS AS APPLIED TO CLINICAL EDUCATION

There are three basic elements that must be considered in any attempt to develop an allied health education program that has as one of its objectives the production of graduates who will be expected to "perform effectively" in a specific allied health occupation.

The first element is a determination of the occupational requirements that the program is to be developed to meet or, in other words, what behaviors we are educating for. Essentially, we must first determine what behaviors are required for the successful performance of a certain health care operation or job. This starting point not only determines the program design but also provides the basis for design of the criteria to evaluate the outcome of the program.

Training objectives, stated in behavioral terms, are the keystone of any good educational endeavor. The major steps in developing such objectives should include analysis of the health job, which is the total of all the tasks an individual is required to do to perform that job successfully. (For example, such a job inventory for the medical laboratory technologist will include 300 or more separate tasks.) Having identified such tasks, task descriptions are prepared that describe the activities expected of the individual in operational terms, such as the purpose of the activity, equipment to be used, conditions under which the activity is performed, and a set of criteria for defining adequate performance, stated in terms of time to accomplish a task, allowable range of errors, etc. These task descriptions together make up a job description that specifies what a persion must be able to do to perform satisfactorily on a particular job.

To illustrate, a radiological technician must perform certain tasks in accomplishing assigned duties. One such task might be an x-ray of a patient's leg. So we would proceed:

Occupation: Radiological Technician

Task: To take an x-ray of a patient's leg

Purpose: To provide a physician with an adequate x-ray for diagnostic or observational purposes

Equipment to be used: X-ray machine, examining table, x-ray film, film holder, film processing equipment

Conditions under which work activity is to be performed: Hospital radiology department, routine as opposed to emergency. Physician exercises supervision and reviews completed x-ray.

| Steps in task performance | Criterion |
|---|---|
| 1. Patient is prepared for x-ray; instructed to remove clothing and don appropriate garment for examination (if not already so dressed). | Patient understands and complies. |

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| 2. | Patient is given appropriate information regarding procedure to be performed and his role in such a procedure. | Patient understands and carries out his role as required. |
| 3. | Patient is correctly positioned for procedure. | Completed x-ray film quality confirms correct positioning. |
| 4. | Technician measures to determine proper distances and positioning of x-ray and film relative to this particular patient. | Completed x-ray film confirms that correct procedures were followed. Time to accomplish this element is also a factor. |
| 5. | Prepare x-ray film, attach identification, and place in proper location. | See above |
| 6. | Activate equipment and make proper settings for correct exposure. | See above |
| 7. | Alert patient and take x-ray. | See above |
| 8. | If indicated or directed, repeat procedure, repositioning patient if necessary. | See above |
| 9. | Release patient from x-ray room with appropriate instructions as to what might be expected of him (wait, return to ward, get dressed, etc.). | Patient understands and complies. |
| 10. | Technician processes or causes to have processed exposed x-ray film. | Film is processed and is of acceptable quality. |

| | | |
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| 11. | Technician observes developed film for correctness and adequacy. | Quality of film in terms of correct aspect of positioning, equipment setting, developing, etc., is acceptable. |
| 12. | Film is made available to physician or radiologist. | Film is acceptable in terms of purpose for which it was directed to be taken. |
| 13. | If indicated, procedure may be repeated at direction of physician. | -- |
| 14. | If procedure is not repeated, area is prepared for next patient. | -- |
| 15. | Technician will observe radiological safety procedures throughout entire process indicated above. | Exposure to x-rays is within limits of safe levels as indicated by monitoring devices. |

We then can move to specifications of knowledge and skills. Selection of the concepts, skills, information, etc. that must be taught to enable graduates to meet the performance requirements stated in the job description determines the means by which the job performance requirements can be achieved. These requirements should be established from a behavioral rather than an operational point of view--and this is by no means a simple procedure.

Having specified the knowledge and skills necessary to meet job performance standards in an allied health occupation, we can proceed to formulate the objectives for a specific education program for that occupation. These objectives will serve as specifications of expected outcomes. To the extent that we have determined the knowledge and skill requirements accurately and completely, we should be able to develop clear and accurate training objectives from these requirements.

There are three general criteria that our objectives should meet:

1. Are they relevant in terms of the knowledge and skills required?
2. Are they complete in that they account for all required performance outputs?
3. Are they measurable? Are we able to devise a measurement for determining that we have indeed achieved a specific objective?

The above is an overly simplistic statement of the process. Training objectives are usually not totally congruent with job performance requirements. Not all required learning can be accomplished in the formal allied health education program. Both student and teacher should be aware that there are things that can only be learned after time spent in the actual work context in a health care delivery setting.

Having defined objectives, it is necessary to look at ways in which these objectives can best be achieved. We must be concerned with developing the clinical education environment. The need is to design a combination of methodology, material, and media that will provide those learning experiences required to realize the previously established objectives. This is a process that calls for developing or designating training tasks and setting up procedures for practicing these tasks. Here we are dealing with two factors: first, the transfer of training from the learning to the operational setting and, second, learning efficiency. Transfer of learning depends on the proper design of the training task, and the procedures we utilize for the practice of these tasks will assure that they are learned efficiently.

A third important factor is the optimal sequencing of learning activities to enhance both the motivational process and the meaningfulness of material being presented to the student. A reasonable and tested approach is one called "functional context sequencing," which consists of:

1. A meaningful orientation to the entire occupation for which the student is being prepared and the relationship of that occupation to the environment or system of which the occupation is an integral part. (For example, for the radiological technician, this means an overview of the occupation and then relating it to the radiology department, the hospital, the health care delivery

system, and the other occupations with which it must interact and cooperate, with particular emphasis always on the patient.

2. Demonstration of the relevance of each new instructional area to the entire occupation at the time the new material is presented.

3. A whole-to-part sequencing, which is essential in teaching functions, particularly of equipment.

4. Each student learning a graduated series of job tasks, each new task requiring the mastery of related new knowledge and skills.

Using such an approach, an overall job context is established, new tasks are related to the job context as they are learned, and the knowledge and skill components are related to the task performance as they are learned.

If we set this approach against the conventional one that requires the teaching of blocks of "fundamentals" as initial elements of a course in which these fundamentals are actually knowledge and skills that are essential elements of task performances that are to be learned at a later time, it is obvious how the latter approach is wasteful of student time, is less meaningful, and increases the difficulty of learning for the student.

This is a curriculum development process requiring a high degree of skill, knowledge, and experience on the part of those who undertake it. Dividing a total occupation into segments of training and arranging these segments in a sequence that assures reinforcement and continual progressive learning is not a simple process.

The present state of the educational art does not provide us with a clear-cut system that enables us to classify all needed allied health training tasks for a specific occupation into definitive categories that are similar to those conditions that will facilitate the learning of these tasks. If we keep in mind, however, that the clinical education environment must be designed to provide, as realistically as possible, those learning experiences needed to achieve specified objectives and if we are flexible in allowing such continuing modifications as experience proves to be advisable, we will be moving in the proper direction.

This is the basic reason for the need for a realistic setting for clinical education, an actual hands-on patient care setting for the radiological technician referred to earlier, for example. In such a setting, the student is exposed to realistic learning experiences that should be consistent with the behavioral objectives set as his learning goals. Presuming good controls, the student is provided with a situation in which his learning progress can be carefully evaluated and his readiness for new experiences can be accurately ascertained.

A short observation on the place of audiovisual media in the education process is in order here. We have seen in the past decade a rising emphasis on the facilitation of learning through the use of audiovisual media and training aids and devices. Several factors have contributed to developments in this area.

1. The increasing complexity of the technologies for which health care personnel are being trained.
2. The pressures of time, dollars, number of students, etc. that have called for increased efficiency in the clinical education process.
3. Media can present controlled, reproducible blocks of instruction that are consistent with principles of effective education and training, more easily than we can generally train or influence the behavior of a large number of individual teachers or instructors. Media can be used over and over again or be presented to a broad variety of audiences in a variety of settings. These two characteristics have added to the impetus for the increasing use of media.

Related to media is the use of simulation, which can range from a very simple model to an extremely complex man-machine interface. The technology of simulation is currently far in advance of the allied health educators' ability to specify what training elements lend themselves more effectively to this mode or to state with any degree of certainty the particular advantages of simulation over reality in the allied health educational field.

Included in this general area of learning technology is the development of automated instruction or self-instruction and computer-assisted instruction, programmed learning technologies that have been the subject of interest since the early 1960's. These methodologies of training are intended to produce highly controlled learning with minimal utilization of instructors' time. Basically, they support a reinforcement of learning by the practice of relevant behaviors in a self-instruction mode.

- These methodologies of training have demonstrated potential in the area of individual differences among students, inadequacies in number and quality of instructors, the need to assure uniform performance capacity, and remedial or supplemental learning situations. A wide variety of texts and programs have been developed to supplement and complement various aspects of allied health educational and clinical training programs in such areas as medical terminology, genetics, and radiology and a variety of programs for assessing clinical judgment.

At the same time, there is the need to utilize more effectively the potential of new advances in instructional technology and media in our allied health education programs. Despite the availability of a wide range of self-instructional, audiovisual, computer-oriented, and programmed learning technologies, we are still largely utilizing the traditional curricula and teaching approaches.

## III. QUALITY CONTROL IN CLINICAL EDUCATION

The emphasis in this monograph is on the quality control of the educational program and its product--the trained graduate. We are basically concerned with the problem of evaluating the allied health educational program in terms of the goals that have been established for it.

We have seen much emphasis on this process of evaluation in the past decade. We have always had testing as a part of the educational process, generally with the primary purpose of assigning grades and establishing class rank order, but the pressure of limited resources and increasingly complex technology has pushed us strongly in the direction of assessing greater efficiency in the education process. Evaluation of the process and its subsequent improvement or modification can only be accomplished when we have developed a feedback system that measures the quality of program output and feeds it back to those with responsibility for the operations of the program.

The question of how to accomplish this evaluation in the most efficient and effective manner has lead to greater emphasis on an evaluation methodology. This methodology, based upon carefully devised objectives that state what a graduate should be able to do, under what conditions he will perform, and to what standard of proficiency he will perform, makes a highly useful and valuable criterion for evaluating the education program.

We must consider the difference between proficiency measurements that are norm-referenced and those that are criterion-referenced. Most proficiency measurements in use today are norm-referenced. This means that an individual student's proficiency is evaluated in terms of his own performance as it relates to the performance of other members of his class, sections, etc. This process merely says that one member is more or less proficient than another; since it tells us nothing about how proficient either of them are in relation to a general set of performance standards, it has little value in the quality control process.

On the other hand, criterion-referenced measures allow for independent assessment of performance, which permits us to determine to what extent an individual exceeds, equals, or falls short of performance standards that are an absolute standard of quality. Criterion-referenced proficiency measures can be built into programs that have been designed on the basis of establishing training objectives, which are stated in the form of job performance standards. Quality control or assessment of the programs, then, measures student performance against established standards.

A problem in incorporating these approaches is that all too few allied health programs have based their curricula on the identification of specific tasks and the establishment of criterion levels for their performance. They still depend heavily on written testing or instructors' evaluations of the student's knowledge of defined content areas.

Admittedly, there are certain difficult questions that must be dealt with before we can say that we have proficiency: Under what conditions do we measure it? What type of test instrument do we use? What assurance or degree of reliability do we have? How can we be certain that in both the training and the testing situations we can first develop and then accurately measure the student's performance of activities that are specific elements of the occupation for which he is being trained?

The best and most direct way is to test performance "on the job" of identified activities or elements of behavior. If the standards of performance have been previously carefully established, such an evaluation methodology should prove to be reliable and easy to use.

The previous chapter outlined a task statement for an element of a radiological technician's duties. Each step in the task performance had a criterion statement relating to performance actions, conditions, and standards. Such criterion statements, if precisely worded, obviously lend themselves to the evaluation of the student's mastery of the task performance objectives. Our radiological technician student was put through the functional context sequencing process described earlier.

1. He was oriented to the entire job of a radiological technician.
2. He learned the series of tasks, each with their requirement of new knowledge and skills that make up that total job.
3. He learned the equipment he must use in that job in a whole-to-part sequence, starting with the function of the total piece of equipment, then its components, and finally each single part.
4. He demonstrated, through performance of these tasks in a realistic setting, his mastery and understanding of the objectives for his job.

His performance on the job can then be evaluated in terms of knowledge, skills, and effectiveness. Such evaluation can be made available to the education program as an indication of its effectiveness in producing a qualified (in terms of stated objectives) radiological technician.

Where the program is clearly deficient in meeting objectives, program modifications should be made to correct the conditions producing such deficiencies.

Our evaluation, therefore, of the quality of education provided is directly related to the education objectives established for the program. If we have been able to specify the performance actions, conditions, and standards realistically and precisely and then tested our student's performance at each level of his education against such criteria, we should be able to evaluate the quality of the allied health education program with a high degree of accuracy.

How well does our radiological technician perform all aspects of his job subsequent to his graduation and placement in a work situation? How well does he produce an x-ray film at the direction of a physician or radiologist that provides that physician with the information he feels he needs to properly care for and treat a specific patient? All of the knowledge, skills, and experience imparted by the allied health program and his clinical training is summed up in his competent and patient-oriented production of such a film as required. This performance is the only sound basis on which his education can be evaluated.

The "intent" of allied health education clinical programs is to provide such a training outcome. The problem is that all too often the task of identifying the total listing of all specific behavioral aspects has not been accomplished, at least not to the extent necessary to permit the development of a reasonably valid test instrument that will tell us how successful the learning process has been. A needs exists for comprehensive identification and classification of occupations in the health care field with subsequent development of detailed task analysis and identification for each defined occupational area to enable the classification of those tasks upon which instructional programs and their goals will be developed. Some attempts are underway in this area. This, of course, also implies national acceptance of the concept of such standardization by academic institutions, health care institutions, and agencies and professional groups.

There are areas of clinical education where we may find we cannot establish specific and objective measures of certain behaviors. In such cases, it should be possible to develop tests that will measure behavior, which, while it may differ from that required by the job, still will correlate with job-required behavior. The use of verbal tests to provide evaluation of job knowledge is an example of such tests.

Although such quality control measures are not as implicitly relevant as those discussed above, we can establish a correlation between outcomes of such tests and specific job performance. If such positive correlation is established, they can be a useful evaluative instrument.

There is no doubt that the performance testing approach to establishing the quality of training is a time-consuming process. The question is, however, whether or not just as much time is now being wasted in the additional "on the job" training requirements found to be necessary once the individual student leaves the educational institution and becomes a salaried employee in a health care institution. Another question is where in the process we should place the responsibility for assuring that the student has been adequately prepared to perform at a specific level of behavior and to certify that this has, in fact, been accomplished. Techniques exist and instruments and procedures can be developed to accomplish this goal, but the basic decision of who shall be directed to proceed with the development of such procedures has yet to be made.

## IV. QUALITY ASSURANCE IN CLINICAL EDUCATION

Academic and theoretical concepts must be translated in application in the clinical setting. The length and complexity of such a translation process depend upon the amount of knowledge related to development and application of a specific skill or combination of skills. Obtaining a blood sample, obtaining a urine sample, taking blood pressure, etc. are not normally complex skills, but they do involve some relatively complex issues that are difficult to deal with in a purely academic context. Simulation will not give the student a sense of interaction, often potentially painful, with a real human being with nerves, blood vessels, excretory functions, etc. The point is that the student must deal with a sufficient number of clinical situations to obtain a certain measure of technical skill.

Moreover, as one of the great figures of medicine, Sir William Osler, said, "In the natural method of teaching, the student begins with the patient, continues with the patient and ends his studies with the patient." All else--books, lectures, etc.--are tools and means to an end. He also said, "It is a safe rule to have no teaching without a patient for a text and the best learning is that taught by the patient himself. Give (a student) good methods and a proper point of view and all other things will be added as his experience grows."

Primarily, the hospital is the setting for clinical training. Hospital and health service facilities, of course, consider their primary concern to be patient care; there is always the possibility that the student is viewed merely as a potential source of service or even as an irritation. There is a variable here in terms of the amount of direct patient contact involved in the particular occupational area. Nursing and related occupations have a very high degree of patient involvement; laboratory technicians and biomedical equipment engineers have minimal patient contact albeit a high degree of responsibility.

Those occupations that require a fairly high amount of patient-related clinical experience must organize to provide observation and patient care practice within the framework of the daily regimen and with a minimum of disruption. Direct care experience is more desirable in the sense of skill development, although observation periods can be the groundwork for subsequent skill-building sessions.

A steady flow of clinical teaching materials (including patients) is vital to the success of any allied health educational program. There is at present no adequate substitution for live patient experience, and it is unlikely that there ever will be. This raises the problem of the adequacy of the number of clinical teaching patients and learning situations available in sufficient numbers to assure a quality teaching-learning experience for all students. The patient-student ratio of one student for one patient is considered a desirable minimum, although in practice this ratio is often exceeded significantly. Historically, student-teacher ratios in health care education have been small, influenced by accepted beliefs about student-teacher and student-patient ratios, particularly in clinical areas.

In this and related areas, the burden is on clinical education institutions to assure that their programs operate at maximum effectiveness and efficiency consistent with their objectives and the adequacy of available resources. Such assurance can only come about if there is an ongoing process of evaluation and feedback for improvement.

We are yet to establish an effective information feedback system that will allow input of real needs of the operational health care system into the planning of the academic/training institutions and vice versa. There is a highly evident dichotomy that exists between the reality of the arts of medical care as practiced at all levels by professional and allied health personnel and what is taught to students in the allied health education institutions. This gap will widen to the extent that more and more of the responsibility for programs will be assumed by the formal educational system, and the health care institutions will do less in the education of specific professional and allied health occupations. A permanent mechanism must be found to link the two milieu.

One mechanism, which we have much discussed but not too well practiced, is that of continuing professional education. More utilization of basic occupational preparation of faculty in allied health continued education programs would do much to create an awareness of what the needs of the allied health practitioner really are and, hopefully, to permit the quick modification of curricula to be sure that what is being taught is pertinent to what the student will experience when he becomes a practitioner. This is also true when we are talking about numbers of persons to be trained, types of occupations to train for, content of curricula for training, and effective implementation of training programs required by new technologies or system modifications. Information deficiencies in all of these areas are excessively costly and wasteful in terms of human resources, time, and effective operations for both allied health teaching programs and health care institutions.

Continued improvement of the teaching-learning process is, or at least should be, a continuing concern of any allied health educational institution. All too often, however, such concern merely dwells on the inadequate preparation of the average health care professional for teaching and is an exercise in futility. If there are problems and impediments to accomplishing quality clinical education, the best way to deal with these is first to identify them and then to examine them critically.

There are three aspects of the situation--the instructor, the student, and the environment in which the allied health teaching-learning process takes place. These include such concerns as classrooms, laboratory aids, testing, techniques, media, etc. All elements must contribute to the successful realization of the goals of learning.

First of all, who teaches the teacher? It is not enough to select a competent allied health professional, skilled and accomplished, and expect that by sheer power of inherent ability this professional as teacher will do a successful job of transmitting what he knows to his students. Mere transmission of factual information is not enough--unless we also enable the student to increase in understanding and effective application of facts, processes, and principles to a specific task or to the learning of new areas, which he may execute after leaving the teaching situation.

The learning situation and the institution must be such as to encourage the student's self-direction, self-selection, and responsibility for his own learning through gained self-evaluation. Student-controlled learning based upon specific understandable objectives can significantly accelerate the learning process. The instructor should develop the role of resource person, seeking to increase information sources and materials available to the student, increase the amount of experiential elements in the learning environment, and make certain that the real world of future involvement and the academic/clinical setting are as congruent as it is possible to make them.

There should be a sufficiently adequate student-faculty ratio so that the teacher can act in an individual, diagnostic, and evaluative relationship with each student. Continuing evaluation is an essential basis for future learning. It must be specific, identifying current progress and pointing out future direction as needed. The student needs to know where he is and must be provided with a realistic basis to support both self-directed learning and self-evaluation.

This philosophy is not one that is immediately acceptable to instructors or institutions, but it is an essential element of a good program. It places certain obligations upon the institutions:

1. It requires them to be fully aware of all skills involved in the process of educating the student--at all levels of performance and not limited to just one central area.
2. The instructors must have the ability to see evidence or lack of evidence of competence in behavioral terms.
3. The instructors must be aware of concepts, understanding, and generalizations that are important for a student to accomplish his purposes and goals.
4. Such evidence of maturity or lack of maturity of the student must be related to behavioral objectives and stated in those terms.
5. It involves much watching and listening instead of talking and asking rote questions.

6. It requires a great deal of self-evaluation and self-direction by the student, based on his own developed and developing awareness of individual needs and purposes.

7. It requires that the instructors deal with each individual student in terms of his specific learnings, skills, competencies, concepts, and applications--rather than at some general arbitrary level of learning.

Such an approach enables individuals to learn far more effectively, since they are learning what they have decided they have a "use" for. By involving the student in the establishment of objectives and in the planning and implementation of the learning situation, the entire learning process has far more meaning for the student. As stated earlier, this requires special training, if not a very special type of instructor.

The facilities problem or learning environment is another important element. We are stressing self-development, and this requires access to the type of learning resources that exist in few situations available today. Not just adequate health care libraries, for example, but rather health care learning centers with a wide variety of self-instructional materials should be readily available to the student at all times.

Also required is clinical exposure to a wide variety of real-life situations, presented in a manner that permits the student to grow in knowledge and skills. Mere observation of limited categories of clinical experience is not sufficient. Yet, there is also no point in exposure to clinical situations for which the student is not prepared in terms of knowledge or experience or which offer routine, repetitive, service-type experiences that are an obvious misuse of his time.

The teaching instructors and the clinical education instructors must work together to achieve such situations. Excess numbers of affiliation entered into by an institution, with a concurrent limiting of the amount of adequate clinical exposure, must not be tolerated. A clinical education institution should not accept students unless it thoroughly understands and accepts the curriculum objectives, is adequately prepared, and has quality instructructors and similar basic elements essential to a quality training experience. The institution assumes a major responsibility when it admits students for clinical education--and not just a fiscal or service responsibility. For this reason, there should be clear-cut assignments of internal and liaison responsibility on a continuing basis to assure that the highest standards of training are being met and that such training is constantly being evaluated in the light of the reality of daily clinical practice.

If the objectives of the program are clearly stated behaviorally, the student, the instructors, the clinical education institutions, and the academic institution will be better able to carry out a continuing realistic evaluation, with feedback modification of the ongoing learning experience.

Written affiliation agreements should be examined and reexamined in light of these concerns. Such agreements should be constantly scrutinized from not only an administrative and fiscal viewpoint but also an educational and training perspective.

Qualifications of institutions--both the hospitals and the schools--should be spelled out and challenged where inadequate. The adequacy of learning facilities--classrooms, clinical facilities, and learning resource libraries--and assignment of students must be tested to prove that they are not wanting in any necessary aspect.

If obvious inadequacies are not improved or corrected in a particular education program, the program should be suspended or dropped entirely. This should be the case for all program elements. A hospital should have no hesitancy in condemning inadequacies, nor should the academic institution.

Mere passage of certain examinations and tests is not sufficient evidence of quality. More meaningful assessment and evaluation along the lines mentioned previously is an absolute requirement. Better job analysis, clearly defined behavioral objectives, and continuous student, instructor, and institutional evaluation of allied health programs are basic necessities in assuring quality in clinical education.

Consideration of the ultimate impact of all allied health education on patient care is an absolute requirement. At no time must we lose sight of the primary focus of all health care education, which is the provision of the best health care possible to the individual patient.

## V. SUMMARY AND CONCLUSION

The purpose of this paper has been to develop and identify an area of educational concerns and indicate the complexity of the process involved, the problems inherent in or imposed upon the process by internal and external factors, the institutional setting and relationships in which the process operates, the problem of identifying intended or desirable outcomes, and the evaluation of the degree of success in achieving these outcomes with an identifiable "quality."

It is obvious that this is no simple task. The multiplicity of variables--jurisdictional complexities, funding problems, inadequate or nonexistent learning objectives--produce a difficult task, not only for instructors but also for evaluators. It is not enough to evaluate the student in the educational situation, no matter how realistic we make that educational experience. The real evaluation is only the basis of performance on the job; yet by this time the student and the educational institution have separated, and most responsibility for follow-up evaluation has been abdicated.

Learning at an acceptable level should occur if the following three elements exist: clear and validated behavioral objectives based on explicit and realistic job descriptions and task analyses utilized by a competent and motivated faculty, sufficient faculty and opportunities for experiential learning in as realistic a situation as possible, and well selected and motivated students.

Constraints on the attainment of the above stated goals are, unfortunately, considerable. A nonexistent national health policy, erratic ebbs and flows of federal funding complicated by a multiplicity of special-interest goals, and rising costs of the educational process with no clear acceptance of responsibility of "who should pay for what" all translate into less effective marshaling of resources at the teacher-student interaction level. This is paralleled by a proliferation of specialization-increased fragmentation and multi-leveled job breakdowns within a given occupational area, increased delegation of functions and task responsibility from higher to lower levels, burgeoning technological advances that assure rapid obsolescence of the specialized practitioner, and a widening dichotomy between the educational milieu and the employment milieu as to expectation, role, etc.

The need for realistic experiential elements in the clinical education function is emphasized. The intense empathetic interaction between patient and health care practitioner must have the roots of its development in the initial clinical experience of the practitioner. Real people with real nerves, real blood, real secretions and excretions, real pain, and real emotions are the stuff of health care, and simulation can never totally substitute for that experience. This is not to say that there are not excellent possibilities for simulation to prepare the student prior to exposure to a real-life experience. The use of a computer-programmed diagnostic procedure, the use of a rescue-Anne, and the amplified sound of heartbeats all have value in their proper place in the education process, but they should always be reinforced by the lessions of reality.

The use of audiovisual media to shorten the distance between a student and the patient and to allow ten students to look into the same patient's mouth at the same time or over the instructor's shoulder "close-up" has significant potential if properly utilized. Again, however, it is only a supplement or complement to the hands-on, person-to-person reality in allied health education.

Students do not necessarily have to acquire this real-life experience in the framework of the standard academic sequence, however. It can be, and is often, done on the job, after the practitioner is certified or licensed as a graduate allied health professional. The question of whether this is really being fair from the point of view of the patient, the health care instructors, the newly certified practitioner, and society can be raised, however.

If we recognize that there is a need for such experiential learning, then we need to reexamine our methods of certifying the new practitioner and also our methods for assessing that all students passing through a partial occupational educational experience have the same level, same degree, and same quality of education.

A basic approach, as stated earlier, is a sound role definition and a clear and specific occupational/job description, which can be broken into measurable behavioral objectives, achievable within a specific period of time and acceptable to the allied health educational institution, the potential health care employer, and the student. This approach, coupled with adequate faculty preparation, sufficient number of faculty, and adequate opportunities for experiential learning continually and adequately evaluated should greatly help in the effort to assure quality clinical education.

Evaluation of clinical education should be a balance of a demonstration of knowledge of principles, processes, and facts and a demonstration of applied skills and a test of the ability to apply these skills and knowledge in dealing with new situations that are not specifically dealt with in training or that represent new technologies or concepts. Job satisfaction of the health care employer and employee is an element of evaluation too often overlooked; the gap between educational programs and the employment scene reality is often too wide. Educators must recognize that there is a limit in cost and time to the amount of education and training the average hospital or nursing home is able to accomplish while still dealing with the economic realities. Part of the quality assurance is more open and continual dialogue or two-way feedback between these two elements of the process. This is true of those hospitals with and without clinical affiliation.

Education and the health care establishment are going through periods of scrutiny, criticism, and challenge that induce an almost paranoid defensiveness on the part of college presidents or hospital administrators. Although there are many aspects of the process that are unfair to hard-working and dedicated leaders, there is much opportunity to examine the rationality and validity of many of the current and accepted ways of doing things in both education and health care. The opportunity is highlighted in those areas in which these two systems share a common concern--the development of health care practitioners at all levels.

Our societal responsibilities demand of us that we take into account the cost to society in time, money, and effectiveness of our activities and assess our effectiveness in meeting these responsibilities to the best of our abilities.

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# FEASIBILITY OF INTERNSHIP PROGRAMS AS AN ADJUNCT TO CLINICAL EDUCATION OF ALLIED HEALTH MANPOWER

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It seems axiomatic that preparation for a practice occupation should include experience in the live or practice setting. The implication of this observation for program development in the various fields of the health sciences is evident and well documented. Allied health curricula have routinely followed the traditional medical pattern of education and its corollary emphasis on service-centered practice.

The differential in the length and purpose of the more than 125 primary allied health education programs, however, has resulted in wide variances in the placement and extent of clinical education. Many programs provide a range of clinical experiences, beginning with a concentrated didactic period and culminating in a block-type internship that may vary in length or duration from four weeks to twelve months.

Qualifications for registration, certification, or licensure in many of the allied health occupations include specified basic clinical experience requirements, in addition to a clinical internship or clinical affiliation, as well as prescribed national examinations and specific minimal educational and personal requisites. For example, both occupational therapy and physical therapy include an affiliation requirement in their "Essentials" as a stipulated requirement for approval for licensure. The regulations of the American Occupational Therapy Association specifically state that eligibility to take the Association's national registration examination "is based on successful completion of both academic and affiliation requirements."

In medical education in the past decades satisfactory completion of an internship has led to licensure to practice. Until recently, the internship has been considered the initial phase of the graduate study period required by the "Essentials of an Approved Internship," prepared by the Council on Medical Education of the American Medical Association. The essentials state:

> "Most authorities today are agreed that after graduation from medical school every physician should have at least two years of graduate education and training in a hospital before he undertakes the practice of medicine."

Since 1970 the first year of an approved residency program has been acceptable to the Council on Medical Education as an internship approved by the American Medical Association.

The current medical curriculum trend is toward shortening the time spent in medical school and eliminating the internship requirement so that the newly graduated M.D. can move directly to residency status. This trend will undoubtedly have its effect on curriculum planning and implementation in the allied health fields. Only time will reveal whether this effect will be limited to changes in terminology or will serve as the basis for reassessment of current approaches to the clinical practicum.

It is highly unlikely that postgraduate internships or practicums would meet with much favor among an aggregate of health science educators. The majority of the health science disciplines, including occupational therapy and physical therapy, developed via a service- or apprentice-oriented route in which there was little time, opportunity, or environmental readiness for theoretical learnings in the natural and behavioral sciences as the basis for effective practice. While the need for repetitive practice and the concept of "learning by doing" continues to have wide acceptance among health science educators, regardless of the level or length of the individual program, there is general concurrence that the clinical experience must be pertinent to the specific purposes of the program in which the student is enrolled. This, in turn, means that the educational value of the experience must be explicit and must be of consequence to the student's development as a competent practitioner.

Unfortunately, the lack of quality testing tools at this time makes validation both difficult and frustrating. Since the strength of a stance or opinion is in direct relationship to the supporting evidence, this inability to provide objective rationale for specific clinical learning requirements frequently results in health educators and service representatives agreeing on purposes but being far apart on the means to their implementation.

Successful integration is highly dependent on a structured, sequential plan for providing clinical experience pertinent to the adequate preparation of the student or new graduate for the role of employee in a specified health service area. As both a culminating and an initiating experience, the internship should assist the intern to call upon all of his prior theoretical and clinical learnings as he attempts to assume his role as a health practitioner and to make his optimal contribution, directly or indirectly, in the practice setting.

This, of course, was the orignial intent of the medical internship. It was put into effect in the early part of the twentieth century to compensate for deficiencies in the medical school curriculum and the general professional and public concern for the lack of readiness for practice of the beginning physician. In actuality, the medical internship has tended to be a fragmented, service-oriented experience with little resemblance to the educational pattern that is generally thought to be needed to insure the desired readiness for practice.

Its major flaw appears to have been its isolation from the mainstream and purpose of the medical school program. Nonetheless, the continuing interest in internships or similar direct-experience learnings springs from both the need for practitioners who can perform competently and the persistent belief that it is a cure-all for practice deficiencies.

The pregraduation practice experiences of many allied health sciences, such as medical records, occupational therapy, physical therapy, and dietetics, tend to incorporate certain features of the classic medical internship within their curriculum design. This is usually influenced or governed by accreditation, certification, or licensure requirements. Many of the accreditation essentials prepared by the Council on Medical Education of the American Medical Association in collaboration with the professional associations of particular allied health disciplines contain specific minimum requirements for the student's directed practice experience, expressed in terms of time, structure, and/or content. For instance, the essentials for medical records administrator state that "it is strongly recommended that at least one of the assignments for directed experience be full time, extending over a 2 to 4 week period." Others, such as occupational therapy, require approximately six months in the clinical setting.

Such clinical experiences are likely to be of a culminating, service-oriented nature under the supervision of a member of the service agency's staff. Usually there is only minimal student contact with faculty of the educational unit offering the program. Although the student may have a number of needed experiences or a required project plan, busy staff in a constricted, service-oriented setting may not be able to arrange for the anticipated learning opportunities. This is not peculiar to the health science disciplines.

Certainly the postgraduate internship as an adjunct to clinical education of allied health manpower is a concept that has high potential for:

1. Applying theoretical learnings with minimal supervision
2. Developing the new graduate's confidence
3. Lessening the period of initial work orientation
4. Allowing time to compensate for gaps in student's clinical proficiency
5. Insuring readiness for employment through repetitive practice and direct implementation of the concept of "learning by doing"

A number of significant factors, however, militate against the attainment of these goals through the postgraduate internship. They include the:

1. Lack of precise guidelines or criteria for the postgraduate internship
2. Shortage of quality environments for student practice
3. Lack of continuity with the theoretical learning base
4. Emphasis on time spent rather than practitioner development
5. Lack of prepared or available role models in the clinical setting
6. Isolation of the student from the educational institution

If we are to increase the ability of the various health occupations or professions to meet the public need for adequate care in the arena of health service, we need to focus on purpose and process rather than on terminology and tradition. Whatever it may be labeled, supervised experience in the actual practice setting is a vital and essential part of the allied health trainee's preparation.

If allied health practitioners can learn from the internship experience rather than merely replicate the fragmented, stereotyped experience endured by so many medical interns over the years, they are more likely to design an internship or equivalent practicum that is suitable to the needs of the individual student rather than one that has little to commend it, except, perhaps, its name and its association. More important than terminology are the defined purposes of the experience, the quality of the setting, and the method of implementation. When these points are clear, the potential for a successful learning outcome is correspondingly increased. Readiness for practice is not only a desirable goal but also a mandatory goal for every educational program in the field of preparation of health practitioners.

If, then, we focus on "readiness for practice" as a prime objective rather than concern ourselves with conceptual titles for experiences leading to such readiness, consideration can be given to identifying alternative clinical learning patterns that have the potential for facilitating attainment of the practice-readiness objective. Three alternative patterns are given in the following table:

### Alternative Patterns for Clinical Education of Allied Health Manpower Including Internship

| I* | II** | III*** |
|---|---|---|
| Postgraduate-Required Internship | Postgraduate-Elective Internship | Pregraduate-Required |
| External to curriculum | External to curriculum | Internal to basic curriculum |
| Full time; variable length depending on student need and ability | Concurrent with initial employment | Required for graduation |
| Stipend | Part time or full time | Presumes pre-employment testing will be used to verify beginning competency |
|  | Salary differential |  |

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*Pattern I presumes resolution of the factors currently limiting the postgraduate internship concept as outlined earlier in this monograph.

**Pattern II offers the reward of a salary differential for time spent. Experience could be mandatory for prospective employees who failed to perform adequately on pre-employment tests.

***Pattern III places the responsibility for beginning competency on the educational institution. Employers would utilize pre-employment testing as an assurance of competency safeguard. New graduates who failed to qualify would be required to complete Pattern I or II before becoming eligible for employment.

Each of the clinical education patterns outlined in the table includes experience in the live setting as a vital part of the learning process. Insofar as such direct experiences promote the achievement of the identified and desired outcomes or objectives of the prescribed educational model, they are significant learning determinants in the preparation of allied health manpower. The selection of salient clinical learning experiences is also a prime factor in developing the knowledge, skills, and attitudes that are essential to readiness for practice. Failure to provide, or inability on the part of the student to utilize, sequentially significant clinical learnings is a major cause of failure to reach the intended outcomes of the particular experience.

The value of pregraduation internship experiences is in large measure the opportunities provided for a student to experience his future work role while he still has the benefits of direct faculty supervision and guidance. In contrast, the postgraduation allied health internship is very likely to be an unstructured, enforced apprenticeship that focuses on time spent rather than on the specific learning needs of the new practitioner.

Rather than serving as a hurdle, or a final barrier before the student becomes a free agent, the internship or period of concentrated clinical experience should be a prime opportunity for the novice to experience the realities and satisfactions of becoming a full-fledged member of the health care system. In fact, this purpose should permeate all clinical learning experiences from the point of initial exposure to graduation. Planned clinical experience evolves in an orderly and sequential manner, going from the simple to the complex, within the construct of the theoretical foundation pertinent to the particular field of allied health practice. This requires attention to the total curriculum structure and the related sequence of learnings, both theoretical and clinical, that are appropriate and necessary to the development of a competent practitioner for employment in a designated health service area.

Employer and public reliance on the mechanics of the internship, including the "time spent" factor, has tended to emphasize the limitations of this method of learning and its value as the induction point for certification, licensure, and employment. With the objective of readiness for practice, the design and conduct of the curriculum should be such that, upon graduation, every student is employable to the extent that his presence will be a vital differential in the setting where he is employed. If one accepts the principle that there is no one way to prepare a practitioner for a particular field (while bearing in mind the minimal required outcomes for that field), the possibility exists for innovative developments that could enhance the quality of the total learning situation, both theory and practice, and thereby prepare a graduate who is also a competent practitioner in his field.

The key is to avoid the semantic confusion and go to the heart of the present situation. The primary motivating force for the internship pattern is employer concern over what many of them believe is "lack of readiness for practice." The argument can be immediately obscured by the question of what constitutes readiness. A simpler approach and one that would seem to provide for resolution of the problem rather than fruitless discussion would be to focus on goal attainment.

Until there is a clarification and subsequent synthesis of the employer-educator views on this issue, the method and outcomes of educational preparation and the expectations for utilization of beginning practitioners will continue to be an unresolved and highly sensitive trichotomy as to what comprises the essential mix, blend, and sequence of theory and practice leading to practitioner competency. Yet, even agreement among health professionals in both education and service may not be broad enough to resolve this complex problem. The SASHEP Commission viewed the constituency of accountability for the health sciences as even more broadly based.

As stated in the Commission's May 1972 Report, it

> "...includes in varying ways the educational institutions that offer programs of study in health professional fields, the potential employers of health professionals, the federal and state governments, students, and ultimately the public-at-large."

Under this broadened concept, the traditional triad of responsibility--educators, service personnel and students--is extended to an open-ended hexagon that includes a concerned public and several levels of government. The resultant pressure points of legal restraints and public accountability highlight the problems present in our current non-system of health care delivery services. They may also motivate health professionals in both education and service to resolve one of the more crucial issues in that non-system--personnel preparation and utilization.

The dearth of detailed and objective documentation regarding the preparation process and the job performance of health science personnel, however, makes assessment uncertain and recommendations for change hazardous. Yet, there is sufficient negative input about both preparation and performance to give consideration to the testing of educational methods that appear to have potential for insuring the job readiness of the beginning practitioner.

Systematic effort is necessary if meaningful results are to be obtained. In addition, there is also a need for assessment of a broad cross-section of clinical experience outcomes and an identification of examples of success. Promising efforts should continue to be tested, refined, or adapted in a variety of controlled clinical learning environments so that precise guidelines or criteria pertinent to any clinical learning experience can be established and utilized.

Such an approach does not deny or eliminate the internship as a means of attaining proficiency. Rather, it asks, "What is the most effective way to achieve practice proficiency?" and "How should the learning experiences requisite to the attainment of this central primary goal be selected?"

There are a number of alternative courses of action that appear to be worthy of further testing and investigation. The proposals made are based on several philosophical assumptions that appear to have at least verbal adherents in both the field of health science education and that of health care service:

1. The individual who successfully attains the goals of an accredited health science program is eligible for graduation and ready for beginning practice in his field of preparation.

2. A beginning practitioner is prepared to perform the basic cognitive and manual skills common to his field of preparation.
3. All new employees require orientation to the unique aspects or features of an employment setting.

Together, these assumptions form a tripod of support for the concept of practitioner competency. Inherent in the scheme is program verification of the competencies of its graduates, practitioner self-responsibility, and work environment quality. Basic to the validity of these assumptions and their actual acceptance is the educational preparation of the student. Regardless of the length or type of health science preparation, the subtle blending and mutual reinforcement of pertinent theory and practice leading to practice competency (PC) is the sina qua non of the proficiency-oriented curriculum plan. This includes the "why" (Y) as well as the "how" (H) and "what" (W) of program content and methodology. When these are viewed within the constructs of teacher preparation (TP), student potential (SP), and the environmental adequacy (EA) of the learning setting(s), the process and potential of the program plan become more visible:

$$PC = \frac{W + H}{Y} \times (TP + SP + EA)$$

The sense of quality outcomes and goal attainment is present, but the precise verification is lacking. For the performance-oriented disciplines of the health sciences, test of program adequacy is commonly documented by the performance and reputation of its graduates. The results are sometimes less than gratifying. The inability of new graduates to meet the competency expectations of employing agencies is well documented.

In an effort to bridge what is described as the gap between "graduates' expectations and nursing service demands," the University of Chicago Hospitals and Clinics conduct an ongoing, individualized three-month internship program for registered nurses with less than six months' work experience.* The program is elective and is planned within the regular work schedule of the new employee. Participants receive full salary. The volunteers in this postgraduation or beginning work-study "internship" include graduates of diploma, associate degree, and baccalaureate programs. Although there is some evidence that these graduates were not prepared at the time of employment to meet the skill expectations of their employer, no effort was made to differentiate among their several and different levels of preparation.

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*Although it is labeled as an internship experience, this arrangement appears to be the orientation part of a well-constructed staff development program.

In a planned curriculum, conditions necessary to learning extend to all aspects of the student's experience, including the internship or practicum. No part of the curriculum stands alone; each experience has its defined and delineated purposes.

Consequently, the purpose of the clinical practicum, whatever the health field or level, is: to assist in the further development and molding of the knowledge, skills, and attitudes essential to competent performance in the designated area of work in the allied health field; to learn and understand the broad range of health science needs, from prevention to crisis; and to provide an environment where theory and practice take on a new dimension as they are refined and blended into a rational approach to providing competent health care. These purposes should be clear to all concerned--the teacher, the student, and the personnel in the clinical setting. As Steinbeck has noted, "Man...grows beyond his work... and emerges ahead of his accomplishments."

The clinical practicum or internship should be structured to:

1. Enable the student to relate and apply his theoretical learnings within the health care setting
2. Promote continuing learning based on clearly stated expected behavioral outcomes

3. Allow sufficient time for the student to accomplish the predetermined purposes of the experience
4. Permit shared evaluation of the experience
5. Provide role models and participatory opportunities consistent with the occupational expectations of graduates in the designated field of allied health
6. Enable the student to develop competencies crucial to the setting in which he will practice

This proposed structure reflects the need for every allied health curriculum to include a range of direct clinical experience in an actual health care setting. Regardless of the length of the program, learning opportunities in a live practice environment, whether at the patient's side or in a laboratory, are essential to readiness for practice. The objectives of the program rather than its length will determine time allotted in the setting. The time allotted for this experience in a one-year program will necessarily encompass a relatively short experience period; whereas in a four-year baccalaureate program, both spacing and placement of clinical experiences can be more varied and of increasing complexity and depth, depending upon the objectives to be attained. The time factor should be dependent upon what is required to accomplish the identified learning needs of the student.

It cannot be stated too strongly that, in every instance, the clinical practicum is intended to provide a vehicle for adding to the dimension and significance of theory. It cannot be overemphasized that the practicum should be a systematic means of orienting and acclimatizing the allied health student to the actual care situation. From this viewpoint, key issues are: How does the purpose of the experience relate to the immediate course goals and/or the longer range program goals? Is it situation or preparation oriented? Does the student recognize the significance of the experience to his career goals? Does the experience contribute to practitioner readiness?

If the barriers of the postgraduate internship as outlined earlier in this monograph could be overcome, such an experience would have high potential for insuring the new graduates' readiness for competent practice. Since the barriers are both long-standing and complex, it appears highly unlikely that they can be readily resolved. For that reason, the pregraduation type "internship" (Pattern III) appears to be the most realistic approach to practitioner preparation within the context of conservation of time, institutional accountability, and employer and patient safeguards.

A number of requirements are associated with this approach. A critical ingredient, of course, is the availability of a competent practitioner in the setting who can assume responsibility to serve as a continuing role model, to do that which is necessary to induct the student into the ideals and realities of his career option. In addition to basic competency in their field of practice, these key practitioners would, hopefully, have the flexibility, perception, and interest to work in a planned, minimally supervised, tandem with students.

The ideal, of course, would be a joint faculty-service appointment. Qualifying practitioners would meet the requirements of the educational institution for employment and be familiar with its purposes, as well as being competent, as required by the health care facility. The realities of limited, available facilities in many areas result in an internship distance factor that frequently limits the possibility of a dual faculty assignment. In such cases, communication could be facilitated by periodic conferences and by the appointment of the health facility employee as an adjunct clinical instructor. This would insure the possibility that this practitioner, and hopefully the staff of the facility as a whole, would have knowledge of the philosophy, theoretical foundation, and goals of the program and an awareness of the student's educational and experience status and the specific level of clinical sophistication needed to bring the student(s) to the point of employability.

Needless to say, the service person who assumes such responsibility for the student's culminating clinical learnings must have released time to accomplish the purposes of the student's experience. One way to arrange this would be for the educational institution to employ the individual for the portion of the released time required. The other, and more common, method would be for the service institution to contribute the necessary released time as a tangible demonstration of its commitment to the particular program as well as to the preparation of health workers in general.

A representative of the educational institution should certainly visit the facility at least once during the student's period of internship. Flexibility in the length of internship would assist in focusing on the objectives of the assignment internship; that is, as soon as the student had attained the identified goals of the experience, the internship would be concluded, or it could be expanded for a reasonable period of time if necessary until there was evidence of goal attainment.

Such a goal-oriented approach to the clinical practicum or internship provides a logical, clearly defined, and reality-based system for assisting the student in preparing for the practice setting in which he is seeking to be employed. It allows the teacher, the student, and the adjunct clinical instructor or supervisor to jointly identify needed learnings and organize a plan for acquiring them. When the components of the plan are clear to all concerned, it can be more readily assessed or evaluated. So, too, can the student's progress.

As noted earlier, inherent in these and all other speculations regarding the preparation of allied health personnel is the seeming dichotomy between the purposes and intent of allied health educators and the expectations and realities of the health care employer. Somewhere between these trenchant extremes there is the possibility of cooperative endeavor based on common purpose.

Identification of common concerns provides a good beginning. A simple follow-up questionnaire to the educational unit, the local employers of recent graduates, and the graduates themselves offers a ready source of direct performance feedback. The resultant findings can serve as a source for discussion points for a meeting of faculty-service representatives. A standing interinstitutional committee on quality performance can also be of inestimable value in centering on the problems and potentials of preparation and utilization of health care personnel. It seems logical for the educational unit, as the "producer of the product," to initiate such arrangements. Then, too, service personnel are reluctant to be cast in the role of villain; they know that accolades are equated with love and understanding, whereas suggestions for improvement may well turn them into unwelcome interlopers.

In addition to ongoing dialogue, there is need for continuing reexamination of both the purposes of allied health discipline(s) education and the utilization of the resulting products. Cooperative delineation of these areas of obscurity and subjectivity and new and more fluid forms of teacher-student-employer collaboration are needed to effect the often sought but highly elusive ideal: that the preventive, maintenance, and crisis health needs of people will be better met through the able contribution of adequately prepared and, thereby competent, allied health personnel to the day-to-day quality of health care services.

Allied health science practitioners in educational and service settings have the opportunity to set the pace in the quality preparation of newcomers to their respective fields. The extent of their accomplishment will depend in large measure on their ability and willingness to go beyond the status quo and develop more effective ways to attain their stated goals.

In the process, the pregraduation internship serves as a departure point; it makes only the reasonable demand that the new graduate demonstrate preparedness or meet the requirements of Pattern I or II to become eligible for employment. Insofar as this can be objectively accomplished, there is likely to be better institutional and individual accountability for the quality of health care services and opportunities for new graduates to effectively actualize their preparation in the health care setting.

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# THE ROLE OF SIMULATION AS AN ADJUNCT TO CLINICAL TRAINING OF ALLIED HEALTH MANPOWER

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It occasionally happens that at night over swampy ground there appears a phosphorescent light that behaves in a mysterious manner. The light sometimes hovers, sometimes flits and dances. When one approaches it, the light seems to disappear. (The usual scientific explanation of this mischievous light is that it is the result of spontaneous combustion of swamp gas generated by rotting organic matter.) Because the light has occasionally misled travelers, it came to be known as *ignis fatuus*, a Latin term that translates to "foolish fire."

The educational rationale and practice of clinical education in the allied health sciences have always had this "will-o'-the-wisp" ephemeral quality. From a distant vantage point, the merit of the idea of clinical education seems unassailable. How better to learn than by doing? The system and its advantages have generally been accepted as an integral part of the education of students in health occupations, just as we have generally and uncritically accepted a plethora of other educational dicta such as: formal education is better than informal education; in smaller classes, the learning is better; and the doctrine of formal discipline continues to be relevant regardless of societal changes.

Professional educators as a group have been reluctant to submit clinical education to the microscope of evaluation. This judgment is based not on the number of words written about the topic (manifold) but on the amount of time and energy that has been expended (as judged by the published literature) on solid research regarding the processes and outcomes of clinical education (virtually none). It is almost as if theories of instruction or learning had never been articulated or concerned about this aspect of education. This monograph examines applicable theoretical formulations to explore how they may or may not be realized in our present construct of clinical education. The main thrust of the monograph will then be directed, as the title suggests, to the concept of simulation, its advantages, disadvantages, and possible applications.

## SOME LEARNING PRINCIPLES

Educators who look to the psychology of learning for guidance in their work are often confused by the amount of controversy generated by representatives from the various schools of psychology. We have tended to forget that there is a body of relatively firm facts that have been accumulated over time. Although these findings will be explained differently within different theoretical frameworks, the findings themselves are fairly well supported by a variety of studies. Of course, in no science are truths established beyond the possibility of revision, and the history of the psychology of learning has been relatively brief. Yet most "schools" would probably agree with the following propositions.(1)

A. Learning Processes

1. Behaviors that are rewarded or reinforced are more likely to be repeated in other instances.

2. Threat and punishment have variable and uncertain influences on learning.

3. Effective reward or reinforcement should follow almost immediately after the desired behavior. Further, the learner must see the relationship between the behavior and the feedback.

4. Forgetting proceeds rapidly at first, then more and more slowly. If recall is planned shortly after the learning experience, the amount forgotten tends to be reduced. Unless detail is placed in a structured pattern, it is rapidly forgotten.

B. Individual Differences

1. No two students react the same in a given learning situation. Differences in heredity, intelligence, motor skills, health, motives, drives, tastes, fears, relationships, and many other areas enter into the production of each student's response.

2. Students vary not only in their productive responses but also in their growth rate.

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C. Level of Challenge

1. Students put forth most effort when they attempt tasks that fall in "the range of challenge," i.e., where success seems probable but not necessarily certain.

D. Learning Methodology

1. Learning rates are faster when the student understands the goals of the experience and their rationale and there has been some student-teacher participation in the planning.
2. Reaction by students to excess guidance by the teacher varies from defiance, through scapegoating, to apathetic conformity.
3. A concept is best learned by presenting it in different specific situations, comparing and contrasting experiences with and without the concept. Application of the concept to new situations not yet considered increases its scope and utility.

Theories of instruction have had the same general "will-o'-the-wisp" acceptance as those associated with educational rationales and practices. Many educators are comfortable with the idea of some general principles of learning and development. We tend to forget, however, that theories of learning are only descriptive--that is, they tell us what happened after the fact, rather than how students can best learn what needs to be taught. On the other hand, theories of instruction are prescriptive and give one guidance for improving learning. Some factors in a theory of instruction seem to have relevance here.(2)

A theory of instruction has four major features:

1. It should specify the experiences that most effectively implant in the individual a predisposition toward learning. Although cultural and motivational factors are important predispositions, perhaps the exploration of alternatives is the most crucial factor. Activating exploratory behavior must be triggered by a level of uncertainty; following the activation, the behavior must be maintained and directed.
2. It must specify the ways in which a body of knowledge should be structured so that it can most readily be acquired by the learner. This structure of any knowledge can be characterized in three ways: the mode of representation (e.g., summary images, symbolic propositions); the economy of presentation (i.e., the amount of information that must be held in mind and processed to

achieve comprehension); and the effective power (i.e., one's grasp of a field of knowledge will never be better than the best that can be done with that field of knowledge).

3. It must specify the most effective sequences in which to present the materials to be learned. The sequence in which a learner encounters materials within a domain of knowledge affects the difficulty he will have in achieving mastery. Obviously there is no unique sequence for all learners, and the optimum in particular cases will depend upon a variety of factors including past learning, stage of development, nature of the material, and individual differences.

4. It should specify the nature and pacing of rewards and punishments in the process of learning and teaching. Knowledge of results must be available at a time and place where the knowledge can be used for correction. All descriptions of problem solving agree that it follows a cycle involving the formulation of a testing procedure or trial, the operation of this testing procedure, and the comparison of the results of the test with some criteria.

These, then, are some generally agreed upon principles of learning and instruction. A most salient question in this monograph now is: How does the clinical portion of allied health education, as presently conducted, function within these theoretical frameworks?

The phrase "clinical education," of course, hardly describes a unitary concept. In this monograph the phrase refers to that portion of a health worker's educational preparation in which the learning takes place primarily through the medium of patients and patient products (such as blood specimens) in a clinical agency. This education takes a variety of forms including: the didactic and clinical education occurring concurrently over a period of years, with both sharing major or minor emphasis, depending on the time sequence of the educational design; the didactic portion preceding the clinical work in somewhat longer time spans, e.g., a quarter of classroom work followed by a quarter of clinical experience; and a situation where a sharp dichotomy exists between the didactic education and an apprenticeship-type experience, such as the hospital internship or clerkship.

In this monograph a basic assumption is: The role of the educational institution in the preparation of health workers is to provide the minimum base of content and experience required to permit a student to enter a certain profession at a specified level. The corollary of this assumption is that the employer and also the educational institution have the responsibility of providing necessary and sufficient "continuing education" and/or "inservice education" to bring knowledges, skills, and idiosyncratic information up to the level required by a specific health service institution. An additional corollary is that the educational institution is aware, in its planning and specifications of the minimum base, of such factors as career mobility, "laddering," and other considerations that could possibly affect the student over the length of his career.

In the real world this distinction between educational and employer responsibilities and expectations is seldom a clear-cut one, and this imprecision regarding the role of each has aspects of an armed truce: some serious negotiations interspersed with occasion volleying back and forth. In an historical context, the present unclarity seems naturally transitional. At the turn of the century, health care was provided by only a few professionals, chiefly the physician and the nurse or midwife. Even after physician education was institutionalized in medical schools, all other personnel were still trained primarily on the job, in an apprenticeship fashion. Today, with more than 160 identified health occupations for which primary preparation occurs in educational institutions, one can still find devoted advocates of the old apprenticeship approach to professional preparation. This type of preparation served the health care community in a pragmatic fashion, and its advocates maintain a loyalty because of this.

No one can doubt that there are some problems with clinical education. Some of the aspects of clinical education that merit consideration are the setting, the patients, and the actual process. Looking at these aspects should make later discussion of alternatives more relevant and purposeful.

## SOME PROBLEMS WITH CLINICAL EDUCATION

### A. The Setting

There is a direct relationship between the extent to which schools are dependent on clinical sites for providing significant and crucial portions of education of allied health personnel and the degree to which schools do not have full control of the process of their educational preparation. It is natural that the clinical site's primary obligation is to the patient, and it must make decisions in that framework. What we are currently seeing are rapid changes in the design, implementation, and delivery of health care services prompted by varied social, economic, and medical factors. The educational institution realistically does not have a large vote in the decision-making committees of the clinical agencies. If a hospital's census drops sharply (as many have in the past year in various parts of the country), the decision to close one or more stations, wards, or floors may have profound effects on the training institution even though the institution has no voice in the decision.(3) A decision by a group of hospitals to consolidate radiological services, a decision necessitated by a variety of factors, can hardly be influenced by the educational institution even though training spaces will be lost.

Alternately, the clinical agencies themselves have a fluctuating demand for services, and these demands are in large measure relayed to the educational or training institutions. Thus we see not only fluctuations in the needs for existing allied health personnel but also the necessity of the preparation of not-yet-existing types of health personnel.

Powerful economic forces, controlled neither by the clinical agency nor by the educational institution, alter the plans and progress of both. The federal government, the general health of the nation's economy, the changing policies of third-party payers--all these and numerous other factors shape and alter the directions and plans of both institutions. An extremely important factor is the continuing search for means to stem the high cost of health services. For example, discussions continue regarding the "true" cost to the clinical agency of having clinical students on the premises and the possibility of referring these costs back to the educational institution rather than on to the patient.

Also, in many parts of the country an acute shortage of clinical sites exists. The expansion of clinical sites has not kept pace with the explosive growth of training programs. The results of this nonalignment have been numerous: the training facilities of many hospitals are tightly scheduled and allow no flexibility in planning or usage of various resources; the patient has become an "over-cared for" individual whose welfare may at times be threatened by fragmented care and over-stimulation; educational administrators have been forced to lengthen considerably the geographical radius in which they must seek sites; and smaller and more varied sites are being utilized, prompting a heavier investment of administrative time, an increased amount of travel time and expense by students and faculty, and a less homogeneous level of experience for the same level students. A serious consequence of the clinical site shortage is the lid that this situation places on both planned expansion of existing programs and the implementation of planned new programs, despite evidence of the need for additional educational capacity in many areas. Schools are being forced into the unhealthy situation of competing with each other for clinical sites in order to accomplish what are considered to be necessary and desirable ends.

We note these observations not simply to complain about situations and conditions that cannot be easily altered but to indicate the problems inherent to a school tying a portion of it's educational system into situations over which it has little or no control.

## B. The Patient

The primary reason for using the actual clinical setting in the educational development of health workers is the access to the real patient and his problems. This positive factor, however, must be weighed against inherently negative ones. Although he is believed to be central to the process of clinical education, the patient is perhaps the most unpredictable and difficult to control variable in the learning situation.

As health practitioner programs have moved away from the apprenticeship model, there has been increasing effort to coordinate the theoretical and clinical aspects of curricula. It is often difficult in the clinical area to find ideal examples of the situation, problems, and/or skills being studied, however. This problem has sometimes been circumvented by assigning multiple students to a single patient, assuming that students learn vicariously by hearing another student describe his experiences with the "key" patient. Another approach often used when the right patient example is not available is to have students read and analyze a written case study as a substitute for the actual experience.

While availability of patients and examples that meet specified learning objectives is perhaps the major patient-related problems, a variety of other factors may interfere with clinical education. Some of these are:

1. Cancellation of the specific treatment, diagnostic test, or therapeutic plan that was considered an important aspect of the learning experience and influenced the choice of a specific patient over others.
2. Changes in the patient's condition, making his care

an inappropriate learning experience or creating an extremely high-risk situation for patient, student, and the clinical setting.

3. Unanticipated discharge or transfer of the patient, leaving the student without an assignment.
4. Interruptions in the patient's plan of care during the time the student is working directly with him, confusing the overall learning experience by extraneous factors and poor timing. Sometimes anticipated learning opportunities are never realized during a clinical laboratory period because of a complex series of interruptions affecting the patient during that period of time.
5. Significant variations in patient census, seasonal variations, and fluctuations in intra-hospital patient distribution.

Still another factor that must be reckoned with a clinical education is the recently emphasized issue of "patients' rights." The increasing cost of medical care, emphasis on consumer rights in general, and growing concerns about overexposure of patients to too many personnel have prompted hospitals to pay particular attention to this area. The recent "Statement on a Patient's Bill of Rights" issued by the American Hospital Association emphasizes the individual's right to refuse treatment and thereby limit his involvement in clinical education.(4) This movement may accentuate the problems of clinical education. Patient willingness to be a subject for learning may come into question more often in the future in the selection of patients for student experience.

An interesting study of the clinical laboratory experience in a baccalaureate nursing program yielded findings that relate to several of the problems cited above.(5) Although the teacher believed that there was correlation of theory and practice because there was correspondence between the topics presented in class and the diagnosis of the patients selected in the clinical area, it appeared that integration of theory and practice was neither overtly nor covertly attained. Theory and application did not consistently occur in a logical sequence to permit correlation of the two. Further, specific learning objectives for clinical laboratory experiences were not present. It was simply assumed that placement of the student near the patient would produce learning. Actually, the structure of the student group in the clinical laboratory was a more important determinant of the nature of learning experiences in the clinical setting.(6)

### C. The Process

The point was made earlier that the "goodness" of the instructional process has a high correlation with the amount of control exerted by the educational planners. "Control" here implies not only the responsibility for the entire direction of the curriculum and instruction but also, by implication, a general adherence to the theoretical principles articulated earlier. Clinical experiences, beyond being the practice or refinement of previously learned skills or knowledges, should be designed to be the primary sources of these knowledges and skills. The situation in which the student must spend a certain number of "clinical" hours following (and generally independent of instructor supervision) completion of didactic work seems to be a relatively artifical situation that rests on the assumption that experience of almost any sort is valuable. Obviously some "learning" does occur under any arrangement. What is being considered here is: given objectives and a finite time framework, what educational treatment results in the highest achievement of the objectives?

What is accepted here is what seems to be the "ideal" in clinical education: the clinical work integrated with the didactic instruction, both under the immediate direction and guidance of the faculty, with student-faculty ratios that result in achievement of the outcomes established for the program.

Let's assume for a moment that the "problems" outlined above were not present and, also, that a sufficient kind and variety of patient did exist, that the economics of place and time were reasonably well worked out, and so on. What kind of problems remain?

Both the typical college classroom and the more innovative learning resource center have some built-in certainties that facilitate the teacher's role and the student's learning. Scheduling, environment, institutional policies, and location of resources are among the many variables that the teacher knows reasonably well due to being "part of" the educational institution. There is not a direct parallel in clinical teaching. An instructor hired by the educational institution is usually the "guest" in the clinical facility and, depending upon the climate there, may or may not be a welcome one.*

In this unique relationship between the instructor and the clinical setting there are many factors that complicate clinical teaching and that can sometimes be significiant problems. First, the instructor must become thoroughly acquainted with the clinical facility, its policies, and personnel so that he can function effectively with students. Further, he needs to orient the personnel of the clinical facility, generally, and of the station or department that is being used, particularly, to the philosophy and goals of the program and the specific objectives of the course and units for which clinical experiences are being sought. Developing rapport with clinical personnel becomes an extremely important factor to insure a good learning experience for students. Much time has to be spent in communication efforts to achieve these understandings, which lead to good relationships. If a program uses a variety of clinical settings, faculty members may find their job in this area multiplied.

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*The approach with which the authors are most familiar, although it is somewhat of a rarity in allied health clinical education.

Whereas preparation for classroom teaching or college laboratory experience is a relatively predictable process, this is not always true of preparation for clinical laboratory experiences. The clinical setting may be some distance from the educational institution, complicating the planning process. When he arrives at the clinical facility to plan and select experiences, the instructor may encounter various difficulties. In fact, the instructor may spend hours at the clinical site in preparation for a single laboratory experience.

If a wide variety of clinical sites is used, it may become virtually impossible for the instructor to provide the direct guidance that has been accepted by the authors as the ideal. Since educational institutions simply cannot afford to hire multiple instructors, who function at various sites with only two or three students each, agency personnel are often called upon to provide much of the clinical supervision. Faculty then become itinerant clinical instructors, seeing the students infrequently and perhaps meeting with them in clinical conferences weekly. A variation of this approach is to hire an additional, often less well prepared faculty member, who is used for clinical instruction only, having no responsibility for teaching the theoretical aspects of the course. The consequence of any of these approaches is that the objectives of the clinical experience may not be achieved, since a well-qualified instructor who knows all aspects of the course is not constantly present at the clinical site.

Clinical instruction itself is filled with high-risk incidents. Often, relatively young, inexperienced students are associated with critical decisions in some way, even though they are not fully responsible for making them. Obviously the stress can be great for both student and teacher. The instructor's stress is often increased by the fact that he has multiple students and cannot always be with them at crucial, risk-filled times.

A great deal of work has been put into the planning and execution of clinical education. How fruitful can we expect this time and effort to be? It may be that the very nature of the process of clinical education precludes making it educationally workable. Look at the clinical teaching situation from an outsider's point of view: Students enter a relatively foreign environment, the complexities of which are only superficially understood; their own anxieties are further complicated by having incomplete knowledge regarding the specific or general care of highly variable patients. Compound this with a stressed concern about the paramount importance of the safety of the patient. Add further (suppressor) variables such as the annotated discrepancies about the procedures, expectations, and emphasis by the teaching faculty and the regular clinical agency staff and also the highly variable attitudes and aptitudes of the students themselves, and a situation exists that seemingly defies the integration of what is known about learning and instruction, factors such as schedules of positive and negative reinforcement, level of challenge, and the structure and sequencing of presentation.

We tend to take some of these inherent characteristics of the situation for granted without much awareness of their ramifications. "Student anxiety," for example, is an accepted fact in the clinical situation. What we tend to forget is that a sufficient body of research has established that information is least useful when the learner is impelled by strong drive and anxiety. One such state has been referred to as "functional fixedness," the tendency of the learner to use corrective information exclusively for the evaluation of a single hypothesis that happens to be wrong.(7) During this period of high anxiety, there is a remarkable intractability or even incorrigibility to problem solving, and at the time straight feedback or other corrective information is least useful. The only adequate instructional strategy at such a point is to terminate the interfering state.

The very presence of the necessary concern regarding patient safety tends to result in a great deal of "negative information," i.e., information about how not to be perform. In concept mastery, this information is not very helpful and, if too distant from the usual mode of information giving, results either in incomprehension or defeat.(8) The entire point of the instruction is, of course, to make the learner or problem solver self-sufficient. If the learner cannot take over the corrective function himself, the instruction creates a form of mastery that is contingent upon the perpetual presence of the teacher.

Most all educators agree that the primary purpose of clinical education is the development of demonstratable competencies in students. Ideally, this is interpreted as the graduate possessing minimal mastery. The complexities of the process of clinical education as presently practiced, however, seems to preclude this real possibility. Mastery models of necessity require a high degree of specificity that reliance on patients with all the previously discussed vagaries simply does not allow. The student takes on a primary allegiance to the patient, rather than to the concepts or skills that are theoretically under consideration. The patient is viewed as a complex entity needing help rather than, for example, a vehicle for testing one's ability to transfer textbook-based and learned treatment modalities to a specific patient.

This inability to make more compatible the instructional strategies employed in the classroom or practice laboratory with those used in the clinical setting probably partially accounts for the research findings of lack of correlation between classroom grades and judgments by clinical supervisors and employers.(9)

### D. Evaluation

No problem in clinical teaching has recieved as much attention as the evaluation of clinical performance. Historically, evaluation in apprentice-style programs emphasized the efficiency, organization, and apparent value. More sophisticated current efforts stress measurement of specific student behaviors that indicate student achievement in applying clinical knowledge and skill in using that knowledge in performance of a patient-oriented service. The phrase "minimal level safe performance" is often used to describe the baseline competencies expected in an area.

Use of behavioral criteria in evaluation of clinical performance, however, is not without its problems. Some instructors have tried to assess the student's achievement of various objectives by keeping anecdotal notes on student behavior. This is often time-consuming and incomplete as a valid, reliable means of evaluation. Further, the question of when clinical experience is practice or new learning and when it is performance for testing purposes enters into this approach. An increasingly common methodology is to develop rating tools based on the criteria and to use these to evaluate planned, specified clinical situations. Again, this approach is not without its problems. Some of these problems are:

1. Difficulty in finding a patient situation that will provide an opportunity to observe the specified criteria

2. Unanticipated patient problems or reactions that complicate the observation process
3. Unreliability due to observer biases or inaccuracies
4. The time-consuming nature of observing each student
5. Limited sampling of the total range of behavior
6. Difficulty in finding varied situations that will demand differing levels of behavior from students at varying levels of development
7. Inconsistencies among evaluation experiences for students in the same lab group
8. The challenge of accurately evaluating the higher cognitive levels, such as synthesis, evaluation, and related problem solving and decision making, in addition to simple knowledge, understanding, and manual skills
9. The difficulty of finding ideal clinical experiences for assessing interpersonal relationship skills and the relative difficulty in actually measuring them

In an effort to standardize the evaluation process, some health fields have moved to "situational tests," controlled "skill testing," or "practical examinations." Often these evaluation situations are staged under controlled conditions in a practice laboratory or learning resource center. Although these approaches are viewed as more valid and reliable than measurement in the clinical setting, the single "situational test" has often been criticized because it does not penetrate to interpersonal relationships, decision making, and the student's ability to deal with multiple variables and problems that characterize the real setting.

## ALTERNATIVE TO PRESENT APPROACH AND ASSOCIATED PROBLEMS

Although this discussion has involved fault-finding, it is agreed that this historically rooted form of education has some validity. Nevertheless, the foregoing discussion of the processes and problems suggests that better and more cost-effective ways to improve the education of allied health personnel might be necessary.

Instructors active in the preparation of the various health workers would probably agree unanimously that experience in the real clinical setting is an essential part of each curriculum. They often argue that "something" is learned in the clinical laboratory that cannot be obtained in any other setting. Yet that "something" is not always well defined and, if it is, the problems associated with clinical education may preclude its achievement.

In one study it was found that such a lack of specific objectives for clinical laboratory experiences led to a "ritualized process" in clinical education.(10) Experiences were not organized to relate to an overall design or plan; teaching was of a hit-or-miss nature in the clinical laboratory; and the learning was generally characterized by trial and error, gaps, and inadequacies. The researcher felt that careful analysis of the tasks involved in caring for the patient was necessary in order to replace the assumption that "something" was learned at the patient's bedside, and one of the implications for further research focused on the need to study more efficient means of teaching the knowledge of clinical discipline.

All the evidence available on factors affecting the learning of the multiple facets of the allied health sciences is still very sparse. While it seems a bit naïve, maybe we need to return to some very fundamental task analyses, to rethink and reinspect the nature of these occupations and the best possible way to prepare people for them.(11) Further, once the essential learnings are delineated, alternate ways of achieving them not only may be feasible but also may be considerably more expedient.

On a superficial level this is simple enough in the educational establishment. One finds the master allied health professional and compares his performance with a completely untutored person; the discrepancy defines what needs to be taught. One cannot necessarily conclude from such an analysis of the performance deficiency that training requires revision, however; it may be that the only significant intervention in the system would be a total revision of the job. As industry has done with its job fractionation, revisions, and sometimes total elimination, this process may be a rational alternative to requiring a human being to reach high levels of competence as a subject matter expert, counselor, group leader, instructional designer, unflagging worker, and whatever else is required by the average allied health professional.

But perhaps this is a bit much. Let's assume that a good task analysis would result in well-stated objectives and valid criterion tests and would eventually bring the job requirements to a manageable level. The instructional methodology problems remain, however, and the translation of all these objectives and requirements is still hampered by a grossly ineffective instructional approach.

Any new proposal for changing the scope and nature of clinical education should ponder the following:

1. It must be based on what we know about learning and instruction (some of the propositions propounded earlier in this monograph).
2. It should include an attempt to carry on some form of research on the instructional process. Too often educational psychologists have come on the scene, armed with evaluative devices, only after the curriculum has already been put into operation. A useful and efficient system would try embryonic instructional materials under experimental conditions, with the revisions and corrections based on immediate feedback.

3. It should attempt to integrate what is known and what is best about educational technology. For example, one of the objections to simulation concerns its "mechanical" nature. A possible reason for this seeming rejection of technology by professionals is fear of devices or of appearing incompetent when attempting to operate a device. Discernible is a more subtle resistance--what has been affectionately termed the NIH syndrome--Not Invented Here. Many a clinical instructor would rather do it himself, and badly, than accept another's approach even if that approach had been fully validated. (12) Implicit here is the research function, since it is obvious that the mode of instruction is not a cure for irrelevancy of content.

The remainder of this monograph delineates an alternative that is particularly responsive to these considerations. This alternative is simulation. Simulation is systematically pictured through its methodology and its advantages and disadvantages. Areas requiring additional investigation as a basis for widespread use of simulation are outlined.

## SIMULATION AS A METHODOLOGY

For the purposes of this monograph, simulation is defined as the creation of lifelike staged activities or games that resemble as closely as possible the actual clinical situation with its variety of problem-solving experiences. In simulation the actual experience is analyzed, and from that analysis a model is derived. The simulation is then based on the theoretical model. Thus simulation does not represent reality directly; rather, it represents the model of reality.(13) Applying this conceptualization to the clinical situation, it would first be necessary to analyze the "real world" experience and produce a model based on that. For example, one might analyze a certain patient care situation and isolate the primary dimensions of that situation as a problem-solving episode. Having done this, a simulated problem-solving experience could be designed around the key dimensions extracted from the real clinical situation.

Simulated experiences can be described as having four crucial characteristics.(14) The first characteristics is that of "analogous circumstances," or a setting that is close enough to a real environment to permit lifelike problem solving to occur. In a clinical simulation this would include the props, the setting, and essentially the unchanging "givens" that are provided as bases for the simulated problem-solving exercise. A second and extremely important characteristic of simulation is that it involves minimal risk, both for the student and the teacher. The learner can try a variety of solutions without harm to another person. In addition, as solutions are tried, the original learning circumstances remain unchanged. Another characteristic of a simulation system is that it provides almost immediate feedback and thus reinforcement related to the consequences of the learner's response. This benefit, like the low-risk feature, occurs without modification of the original physical or psychological learning climates. Finally, the simulated experience is replicable, a control factor that very few actual clinical experiences can incorporate.

Simulated clinical experiences fall into four basic categories. the purely written exercises or program; interactive-interpersonal situations; integrated media-machine activities; and the "trained" patient approach. The commonly used patient case study that calls for student analysis, decision making, and planning comes under the first category. Several recent examples of simulated problem solving in the health sciences, however, seem to offer more challenge to the student in the area of decision making.(15, 16) These approaches use a branched program format and lead the student through confrontation with "good" and "bad" consequences depending upon the decision made or action selected.

Interactive-interpersonal simulations offer a variety of opportunities in clinical education, particularly in the affective interpersonal aspects of health care. Role playing falls into this group, as do the interactive games. This type of simulation offers opportunities in teaching health worker-patient relationships and can also be used for problems that occur among the various health care professionals. Further, role playing has been demonstrated as a useful technique for sensitizing persons to their own behavior.(17) Empirical studies have also demonstrated the positive relationship between one's ability to play the role of the other and development of insights into personal and interpersonal relations.(18)

The third type of simulation--the mediated episodes involving one type of a variety of hardware--yields perhaps the most complex, sophisticated simulations in the health sciences. Media may be used to show real settings and actual patient behavior, and students can be asked to analyze, respond, gather feedback, and then proceed with further analysis of the problem. Computerized problem solving is one alternative in this area. Perhaps the most sophisticated devices in this category are the computer-controlled mannequins being used primarily in medicine. One such simulated patient, "Sim-One," developed by the University of California, has been effectively used to train anesthesiology residents at Los Angeles County General Hospital.(19)

Closest to reality is the fourth type of simulation--the "trained" or "programmed" patient. Barrows decribes this aspect of simulation in detail as it was developed and used in medical education at the University of Southern California.(20) With this technique, persons open to new learnings and having some interest in acting are trained to accurately recreate the history, personality, emotional structure, responses, and physical findings of a real patient. The simulated patient was created to facilitate improved evaluation of medical students studying neurology, but Barrows cites other aspects of medical education that could benefit from this approach, such as postgraduate training programs, evaluation of health care delivery in general, and medical problem solving. Although students and faculty alike were at first skeptical of the approach, most persons rapidly forgot that they were dealing with persons acting the part and were quite able to relate to the "simulators" as real patients. It is conceivable that any of the health sciences could carefully train persons to simulate symptoms, behaviors, reactions, and problems and utilize these persons in highly sophisticated role-playing situations. To some extent the use of actors and actresses in staged disasters to teach rescue work, emergency care, and evacuation procedures to persons in the health and safety professions exemplifies this technique.

## ADVANTAGES OF SIMULATION IN TEACHING CLINICAL CONCEPTS AND SKILLS

The advantages of simulation parallel, to some extent, the problems related to clinical education. Further, they support many of the ideas discussed earlier under principles of learning and theory of instruction. Obviously, the primary advantage is that the simulated portion of a course is under the control of the educational institution and not subject to the decision making of the clinical facility. Similarly, the individual simulated experience can be a controlled experience, one whose variables are carefully selected and are predictable. Thus the instructor can count on the learning experience as one that will relate directly to the specified objectives, and the student consequently can more easily see the relationship between the goals of the learning experience and what actually occurs. These control features make the simulated experience replicable, a factor that provides for consistency for the learner who needs to repeat an experience and consistency from learner to learner.

A further advantage of simulation in clinical teaching is the control of the learning environment in which the specific learning experience occurs. Essentially the "givens" or context of the educational objective can be planned and controlled so that the learning experience itself can be dealt with exactly as planned. While learning is taking place, the environment or context remains unchanged and can be re-analyzed if necessary. Further, environment factors that are considered an important aspect in sequence and concept illustration can be relied upon to remain constant.

Still another benefit of simulated clinical experiences is their low-risk quality. Reactions occur, decisions can be made, and mastery can be achieved without threat to a real patient. Such experiences would provide an ideal context for students beginning to make decisions about patient care. Approaches can be tried in a low-risk setting at a time when the student is bound to make errors.

Further, it seems safe to assume that a minimum of anxiety would exist, preventing some of the problems pointed out earlier as often occurring in high-anxiety situations.

Immediate feedback on the consequences of the student's actions and decision is also a consistent feature of simulated experiences. In the real clinical situation, time factors, patient condition, and a variety of other uncontrollable variables may obscure or delay the feedback to the student regarding the success or correctness of his approaches or decision making. Such immediate feedback, which can then lead to further decision making and action, can be built in as an integral part of the simulation.

Although there may be some question about the amount of factual content that can be learned via simulation, this methodology is particularly well sutied to the teaching process, primarily the problem-solving or decision-making process.(21) The key elements of the process can be built into the model and then implemented in the actual simulation. Situations can be created that illustrate adequate or inadequate processes or correct or incorrect concepts. Then, as suggested by one of the learning principles, new and different problems can be developed to provide experience in applying the process or concept.

Cost may also be an advantage. The initial planning, development, testing, and revision of the simulated package or experience would obviously be costly. A "package" used over a period of time, however, becomes a relatively low cost model of the high-cost environment.(22) Clinical instruction, with its low student teacher ratios, is an expensive portion of the educational program. It will become prohibitively costly if the pressures on clinical facilities ever force educational institutions to pay for using some of their clinical sites.

Simulation also offers considerable opportunities for effective evaluation. The control feature, replicability, and the low-risk nature of simulated situations enhance validity and reliability in the evaluation of clinical competency. The institution with which the authors are associated has done some work in this area. As the basis for an oral quiz question, a short videotape was prepared in which a faculty member role-plays very incorrect crutch walking. The student analyzes the episode, identifies the errors being made, and then describes and demonstrates to another student the correct way to crutch walk. In this situation, analytical skill, teaching practice, and the steps of a psychomotor skill are each given focus. This example could serve as a model in any of the allied health fields--physical therapy, occupational therapy, respiratory therapy, and so forth.

Another example of simulation used to evaluate clinical concepts involves a short videotape that illustrates appropriate and inappropriate nursing care. Using a set of established criteria for evaluating nursing care, the student must analyze and evaluate the care being given and then compare his conclusions with a key that is provided in the learning resource center. Simulation as a means for improved clinical evaluation has also been discussed in some detail by Frejlach and Corcoran, who have used this technique quite extensively with students in a baccalaureate nursing program.(23)

Three examples of simulated learning experiences are presented in Appendix A. These experiences were designed and are in use at the authors' educational institution.

A definite "fringe benefit" of simulated clinical teaching is that it would facilitate research, by nature of the control feature, immediate feedback, and replicability. Both clinical behavior and teaching strategies could be explored via this technique. Simulation provides an ideal opportunity to study problem solving and decision making. It would also permit analysis of how the higher cognitive levels, such as synthesis and evaluation, are achieved.

## OBJECTIONS TO SIMULATION IN CLINICAL TRAINING

Perhaps the chief challenge to this methodology as an alternative for much of the teaching in the actual clinical setting is that simulation is not reality, nor is it based directly on reality. As discussed earlier, a simulated situation is based on a model of reality, the model being a representation of reality.(24) The simulated experience is consequently removed several steps from the real-life situation. Obviously, it is a constant challenge to achieve a valid parallel to the real situation so that variables learned can be transferred to the real situation. Much hinges on how good the intermediate model is. Creation of simulations that closely parallel the real situation is time-consuming and requires a capable designer who can develop a valid model and then build the simulated experience patterned after this model.

In addition to concern about accurate portrayal of reality, faculty often aruge that students in health fields must have frequent "exposure" to the real clinical setting. Although these individuals may not be able to provide descriptions of the specific learnings that are obtained in the clinical setting, they hold firmly to the belief that students need "adequate" time (whatever that means) in the clinical area. Students, too, speak on behalf of "more" clinical experience. This allegiance to the clinical aspects of the course, however, may be related more to positive feelings about clinical experience and the rewards received through patient care than to specific awareness of the learnings that take place in the clinical experience.

As indicated above, simulation in clinical education takes a variety of forms. Interpersonal role-playing experiences, the well-known "incident process," or planned decision-making "games" might be used to portray health care worker-patient interactions. A more controlled form, however, is the complex multi-sensory learning package that utilizes principles of programming and a variety of hardware and media. Those questioning simulation in clinical teaching often criticize the technique because in this more controlled, packaged approach it is a challenge to develop a valid model that emphasizes human interaction. Some educators believe that it is simply not possible to simulate the interpersonal affective learnings that health care workers must achieve. Further, it is argued that simulation tends to dehumanize the education of the health care worker, putting his laboratory experiences on a par with flight training or the training for operating space and/or military equipment.

Another objection related to the one described above is that simulation cannot provide the variety of patient cues that student must respond to and therefore cannot elicit an appropriate repertoire of behavior from the student. A related concern is whether the unexpected variables that the student must learn to deal with in real life can be built into the simulation model. Further, the real clinical setting is believed to be essential to having the student "put it all together," or synthesize, in patient care. Failure to recognize the potential for using simulation as a bridge between didactic and clinical learning also creates difficulties. These objections cannot be ignored. At the same time simulation should be considered in the context of a viable alternative to present difficulties.

## THE ARGUMENTS AND THE CHALLENGE

This discussion has proposed these general arguments:

1. Clinical education in the allied health fields is a poorly defined entity that does not consistently incorporate accepted principles of learning and instruction.
2. Multiple problems related to the setting, patient, process, and evaluation help to explain the inconsistencies in clinical education.
3. The advantages of simulation suggest that use of a variety of forms of well-planned simulated "packages" or situations would assist in accelerating the learning of specific desired knowledge, skills, and behaviors. Further, simulation offers greater opportunities to utilize known principles of learning and accepted guidelines for effective instruction.
4. Clinical laboratory time is often wasted because of the problems described earlier. Yet most educators in health fields would agree that some exposure to the real clinical setting is needed.

5. If many of the learnings now dealt with in the real clinical setting can, if fact, be simulated, then those things that must be learned in the clinical setting have to be isolated and defined. In this era of accountability, increasing pressure on clinical sites, and patients' rights, it is simply not sufficient to speak of giving students "adequate" time in the clinical area or saying they learn "something" unique in the clinical setting without further analysis of the time spent there and the tasks deemed appropriate in clinical education.

The challenge, then, is to design simulations with varying degrees of complexity to serve as alternate ways of achieving objectives that are now assumed to be part of the clinical content of a course. A second challenge to the educator is to describe specifically the objectives or learnings that can be learned in no other setting but the real clinical area. The ultimate consequence, then, would be the extremely effective use of clinical sites.

## NEEDED RESEARCH

Obviously, the entire area of clinical education needs to be analyzed, evaluated, and researched. The assumption that "something" unique is learned in the clinical area needs to be subjected to description and task analysis. Questions that need to be explored are:

A. How do faculty describe, in situational and behavioral terms, the "something" that must be learned with the real patient?"

B. What do students see as the essential learnings that must be achieved in the real clinical setting? Given an opportunity to learn these via simulation, do either their attitudes or skills vary from those of students not having any experience with simulation?

C. Many instructors in the health care fields believe that the unpredictable, the interpersonal-interactive, and such processes as problem solving and decision making in patient care can be achieved only in the clinical setting. Can this assumption be supported with research data? What potential does simulation offer in these areas? Can these facets of clinical education be better defined and isolated so that some can be simulated, while others are dealt with more efficiently in the clinical setting?

The authors have gathered extensive subjective feedback from students and faculty regarding the use of simple simulated practice situations in a multi-sensory tutorial laboratory. This technique has been used with groups of pilot students and during the implementation phases of a project titled "Multi-Sensory Tutorial Instruction in Associate Degree Nursing Education."(25) Details of this effort and the resultant data are provided in Appendix B. Student reactions to the proposed use of simulation are of particular interest.

The above questions speak more to the question of clinical education in general. Specific research and development in simulation should minimally include the following procedures.

A. Sophisticated research designs that permit the data to answer at least the following questions:

   1. How productive is the learning of particular objectives (whether cognitive, skill, or affective) through simulation when compared with the ordinary clinical learning process? This suggestion, and other suggestions below, presupposes adequate behavioral objectives, criteria, and measurement instruments in all cases.

   2. What, if any, are the ascertainable results of the individualization process inherent in simulation? Is retention higher? Do standards rise? Does more uniform learning take place? Does student satisfaction increase?

3. What are the sociological and psychological ramifications of a reduction of clinical exposure because of the introduction of additional simulated laboratory experiences? Frequent literature reference has been made to the value of the socialization processes inherent in clinical exposure, but few if any data have been published in verify this claim.

B. Data must be systematically assembled regarding the economics of learning through simulation per se and when contrasted with present clinical education. Variations here, of course, will be enormous, but widespread collection of pertinent data and their analysis will assist in reducing the multiple unknowns. The following are some questions that should be considered:

1. On what basis can a decision be made about whether to buy pre-made media rather than start production of one's own media?
2. What are the total cost factors involved in the development and production of simulations? These costs must not only include the obvious personnel and equipment costs but relatively hard-to-estimate yet real costs such as

technological assistance (e.g., repairs), need for revision and updating, etc.

3. What are the economics of ongoing faculty costs, given a clinical simulated portion of student preparation, when compared with the usual mode of clinical education?

4. What mechanisms might be developed for centralizing data collection efforts? What ought to be the responsibilities of individual simulation producers to make available or at least known the results, including evaluations, of their productions? What can be done to reduce needless replication of production?

C. Working models need to be developed and evaluated regarding the following:

   1. Criteria for selecting those learnings that have the highest probability of being successfully simulated and/or the lowest probability of attainment through the regular clinical channels.

   2. Criteria for selecting for simulation those learnings that have the highest potential for having the greatest allied health interdisciplinary utility.

# FOOTNOTES

1. Some of the concepts dealt with here can be found in one complete form in: Watson, Goodwin, "What Psychology Can We Feel Sure About?" Teachers College Record, 1960, pp. 253-257; and Spence, Kenneth, "The Relation of Learning Theory to the Technology of Education," Harvard Educational Review, Spring 1959.

2. Theorems about the nature of instruction have been best articulated by Bruner. See Bruner, Jerome S., "The Course of Cognitive Growth," American Psychologist, February 1965; and "The Art of Discovery," Harvard Education Review, XXXI, Winter 1961.

3. Although large regional differences exist, in the Minneapolis-St. Paul area it is estimated that there are 1,300 chronically empty beds out of a total of 9,200 beds in the area. Average occupancy rate for the past year has been less than 75%.

4. Lee, Andre L., and Jacobs, Godfrey, "Community Relations Workshop Airs Patients' Rights," Hospitals, Vol. 47, No. 4, February 16, 1973.

5. A number of the examples of research and educational developments used in this paper are taken from nursing education. The authors are aware that this field is not usually considered one of the allied health professions but maintains a separate status. This field, however, offers appropriate examples by nature of its more sophisticated curriculum developments, the many federally funded projects that have occurred in the field, and the existence of some nursing education research.

6. Zungolo, Eileen Hendrick, A Systems Analysis of Clinical Laboratory Experiences in Baccalaureate Nursing Education, Ann Arbor, Michigan, Xerox Company, 1972. (doctoral dissertation, Teacher's College, Columbia University).

7. For examples of this research see: Easterbrook, J.A., "The Effect of Emotion on Cue Utilization and the Organization of Behavior," Psychology Review, LVI, May 1950, pp. 183-201; and Longenecker, E.D., "Perceptual Recognition and Anxiety," Journal of Abnormal and Social Psychology, LXIV, 1962, pp. 215-221.

8. Hovland, C. I., and Weiss, W., "Transmission of Information Concerning Concepts Through Positive and Negative Instances," Journal of Experimental Psychology, XLV, 1953, pp. 175-182.

9. Hoyt, D. P., "The Relationship Between College Grades and Adult Achievement," Iowa City, American College Testing Program, 1965.

10. Zungolo, op. cit.

11. For recent directions in this area, see: Harless, J. H., "An Ounce of Analysis Is Worth a Pound of Objectives," Falls Church, Virginia, Harless Educational Technologist, Inc., 1970; and Mager, R. F., Goal Analysis, Belmont, California, Gearon Publishers, 1972.

12. Commission on Educational Technology, To Improve Learning: A Report to the President and the Congress, Washington, D. C., GPO, 1970.

13. Twelker, Paul A., "Designing Simulation Systems," Educational Technology, Vol. IX, No. 10, October 1969, pp. 64-70.

14. Beck, Isabel H., and Monroe, Bruce, "Some Dimensions of Simulation," Educational Technology, Vol. IX, No. 10, October 1969, pp. 45-49.

15. de Tornyay, Rheba, "Measuring Problem-Solving Skills by Means of the Simulated Clinical Nursing Problem Test," The Journal of Nursing Education, Vol. 7, No. 3, August 1968, pp. 3-8, 34-35.

16. McGuire, Christine H., and Soloman, Lawrence M., Clinical Simulations, New York, Appleton Century Crafts, 1971.

17. Barrows, Howard S., Simulated Patients, Springfield, Illinois, Charles C. Thomas, 1971.

18. Dymond, R. A., "Preliminary Investigation of the Relationship and Empathy," Journal of Consulting Psychology, 1948, pp. 12, 228-233.

19. Abrahamson, Stephen, et. al., "A Computer-Based Patient Simulator for Training Anesthesiologists," Educational Technology, Vol. IX, No. 10, October 1969, pp. 55-59.

20. Barrows, op. cit.

21. Beck, op. cit.

22. Ibid.

23. Frejlach, Grace, and Corcoran, Sheila, "Measuring Clinical Performance," Nursing Outlook, Vol. 19, No. 4, April 1971, pp. 270-271.

24. Twelker, op. cit.

25. This project was funded by Special Project Grant #5D-10-NU-00330 awarded by the Division of Nursing, Public Health Service, Department of Health, Education, and Welfare. It involved conversions of an entire associate degree nursing program to the multi-sensory tutorial approach patterned after the audio-tutorial system of instruction. Simple written and practical simulations utilizing the problem-solving process are used throughout the curriculum in conjunction with mediated learning packages (modules), which form the core of this approach.

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# EXAMPLES OF SIMULATED SITUATIONS AS ALTERNATES TO CLINICAL EDUCATION

## EXAMPLE A: PLANNING A PHYSICAL THERAPY REGIME INVOLVING ACTIVE EXERCISE ROUTINES FOR STRENGTHENING A PATIENT'S MUSCLES

This learning experience goes beyond the rather clearly defined manipulative skills. It requires observation, interviewing, analyzing data, decision making, and planning.

Terminal Objective: The student will develop a plan of care involving active exercise routine. This will include:

1. Reading the doctor's order for an active exercise program.
2. Conferring with him regarding interpretation of the order.
3. Explaining the order and its purpose to the patient.
4. Assessing the patient's strengths and limitations.
5. Writing a plan of care for the individual based on the doctor's order and the data collected in previous step.
6. Explaining the plan of care to the patient.

Initial Presentation of Skill and Related Concepts: Written case study that illustrates above process and the end product and provides explanatory concepts.

Simulation--Role-Playing and a Multi-Sensory Simulation Package That Utilizes A Variety of Carefully Sequenced Exercises That Demand Student Involvement and Response: Possible activities would be:

1. Reading of simulated doctor's orders and hospital record.
2. Role-playing for interpretation of orders.
3. Role-playing of explanation given to patient, videotaping, and playback for feedback to student.
4. Assessing the patient utilizing a viedotape, slides, and samples of patient-therapist conversations that represent his situation.
5. Validating data gathered from above by written key or videotape.
6. Analyzing data and making a decision--role playing with peers or completing a work sheet utilizing written study questions. Feedback via a written key, videotape, or audio-tape.
7. Writing of plan of care, which is reviewed by instructor and returned with comments.
8. Explaining the plan of care to a fellow student.

Alternate Simulation Methodology: Use of "trained" patient; use of simulated problem solving utilizing the branched program format.

Application in Real Clinical Setting: The above could be repeated until a specified level of mastery was achieved. It would then be assumed that the student could go through this process with a real patient when required.

## EXAMPLE B: ADMINISTRATION OF CLOSED CARDIAC MASSAGE

This clinical skill is one that is fully dependent upon simulation; it cannot be "learned," i. e., mastered through identified sequential experiences, clinically. When the allied health worker encounters this situation in the hospital, he must be ready to apply a battery of knowledge and skills.

Terminal Objectives(1): The student will correctly perform closed cardiac massage. This will include:

1. Identifying the manifestations of cessation of heart action that indicate that closed cardiac massage is required.
2. Making a decision and initiating closed cardiac massage within the appropriate time limit.
3. Performing the skill of closed cardiac massage, including:
    a. Proper positioning of "patient" and technician.

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(1) Nursing Care of Patients With Threats to the Physical Needs: N138, Unpublished Workbook, Nursing Program, St. Mary's Junior College, Minneapolis, Minnesota, 1973.

b. Use of adequate rate of massage as indicated by "patient's" age.

c. Use of adequate depression of the chest as indicated by "patient's" age and size.

Initial Presentation of Skill and Explanatory Concepts: Multi-sensory module or learning package that utilizes written study guide material, an audio-tape, slides, a Resusci-Anni practice doll, and a short videotape.

Simulation--Staged Cardiac Arrest: Using either a "trained" patient, a student, or faculty role-player, a cardiac arrest would be supplied to provide the student with an appropriate context. Given this situation, the student would be expected to proceed through the steps outlined in the terminal objective; however, the actual cardiac massage would be done on a nearby Resusci-Anni doll to avoid injury to the role-player.

Alternate Simulation Methodology: Use of only a practice model, written case material, and props and no use of a human subject.

Application in Real Clinical Setting: The student would be expected to master the situation in a simulated setting and be ready to apply it directly.

## EXAMPLE C: A MANIPULATIVE SKILL--INSULIN ADMINISTRATION

This skill builds upon the basic one of giving parenteral medications; however, it incorporates several new variables that the student must consider. Typically the instructor demonstrates and explains insulin administration and then seeks clinical experience in this area for as many students as possible. It is commonly argued that this is a skill that is best learned on the actual diabetic patient. Diabetic patients are often not available, however, and many students progress on to other topics before they have a chance to practice this skill with a real patient. Simulation offers a solution to this learning situation.

Terminal Objective(2): The student will correctly administer insulin as ordered, meeting the following criteria:

1. All of the past learning for correct administration of a subcutaneous injection is applied.
2. The appropriate syringe for the strength of the insulin is used.
3. The multiple dose vital is correctly rotated between the palms of the hands.

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(2) Nursing Care of Patients With Threats to the Physical Needs: N218, Unpublished Workbook, Nursing Program, St. Mary's Junior College, Minneapolis, Minnesota, 1972.

4. If two insulins are mixed in one syringe, they are the kinds that can be safely combined.
5. The four items that must be checked with another nurse before any dose of insulin is administered are checked with that nurse.
6. The site for injection is correctly located.
7. The site used fits into the existing plan for rotation of sites.
8. Charting is done accurately on the appropriate places on the chart.
9. Follow-up observations of the patient are done.

Initial Presentation of Skill and Explanatory Concepts: Multi-sensory module or learning activity package that utilizes written study guide material, an audio-tape, slides, sample insulin bottles and syringes, and a short videotape.

## Simulation--Simulated Patient-Centered Problem Solving Situation Used in a Practice Laboratory

Props: Several practice models with names and hospital identification.

Simulated insulin orders, kardex cards, and charts for simulated patients.

Variety of insulin types (authentic bottles filled with water) and insulin syringes.

Student Activity: Student is assigned one of the simulated patients and must correctly do each of the following under supervision in the learning lab.

Read the appropriate kardex card.

Verify it with the doctor's orders.

Discriminate among insulin types and syringes, selecting those to be used.

Prepare the insulin injection.

Follow through on all verification and identification procedures.

Analyze the patient record to determine the appropriate site.

Administer and chart the injection.

View a short videotape that shows the patient's behavior a specified time after the injection and verify that the patient ate his breakfast.

Analyze and report content and meaning of the video excerpt.

Alternate Simulation Methodology: Use of a real person who functions as a "trained" patient and becomes part of the learning context as well as the analytical experience.

Application in Real Clinical Setting: After mastery was achieved as described above, no clinical lab time would be utilized for this skill. If the student later gave comprehensive care to a patient who received insulin, he would be expected to give it at that time.

# ANALYSIS OF REACTIONS TO SIMULATION IN ASSOCIATE DEGREE NURSING AND ALLIED HEALTH EDUCATION

In the associate degree nursing program, simulation is used primarily as an interim step between the multi-sensory learning package taken in the study carrel and the actual clinical lab. Feedback from students and faculty suggest the following conclusions:

1. The student now learns the psychomotor skills in the learning laboratory and is checked off on the simulated situation before entering the clinical laboratory. Clinical laboratory time previously used for demonstrations and practice purposes has now been freed to be used for those activities more directly dependent upon availability of the real patient.
2. Students during pilot and implementation phases of the project have consistently rated the simulated practice experiences in the learning lab as one of the most useful aspects of the multi-sensory tutorial approach.
3. Experienced faculty have made the observation that students now come to the actual clinical lab much better prepared and more ready to maximize their time in the clinical area.

Further study of students' attitudes about simulation has been an integral part of the data collection done by a Long-Range Planning Committee at the institution with which the authors are associated.(1) Students in the college were asked to reflect on selected "consequences" of using simulation. Each program is two years in length and leads to an associate degree; all of the students at each level of the program were asked to respond to the question. Results of the survey are reported in Table 1 in terms of proportions of the students who "would like" the various consequences of simulation.

The data shown in Table 1 indicate strong support for the replicability, consistency, and feedback features of simulation. Support lessens on the third consequence--the actual clinical setting would be used only when definitely required for the learning experience. Responses to the fourth choice suggest considerable concern about the reduction of clinical time. A number of students wrote in comments beside this consequence emphasizing that they would not want reduction of time in the clinical setting. Additionally, a

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(1) A nine-member Long-Range Planning Committee at St. Mary's Junior College was involved in an extensive college self-study during the 1972-73 academic year. All of the allied health program faculty and students as well as those in "general education" (see Table 1) were queried on various potential developments in the college, simulation being one of them. The data on simulation used in this monograph originate from that committee's efforts.

TABLE 1

**Question**

It is anticipated that in the future more simulation will be used at St. Mary's Junior College
tion involves the creation of life-like, staged activities that resemble as much as possible t
lab problem-solving situations, role-playing, mock social interactions, etc. Simulations w
of courses. Listed below are some of the possible consequences of using this teaching-lea
like or dislike each consequence.

PROPORTION OF

| | | GE | OTA | | PTA | | MR |
|---|---|---|---|---|---|---|---|
| | | N38 | N32 | N26 | N26 | N22 | N14 |
| | | ** | F | S | F | S | F |
| a. | Learning activities using simulation would be easily repeated. | 79 | 97 | 88 | 85 | 100 | 79 |
| b. | Every student would have a chance to practice the skill or activity that is part of the simulated experience. | 79 | 97 | 92 | 81 | 100 | 93 |
| c. | The actual clinical setting would be used only when definitely required for the learning experience. | 82 | 50 | 54 | 50 | 41 | 54 |
| d. | The total time in the actual clinical setting might be reduced. | 63 | 38 | 35 | 12 | 27 | 71 |
| e. | Feedback about your performance would come from the simulated situation prior to patient or client contact. | 82 | 66 | 85 | 73 | 82 | 86 |

*Proportion of thos
the entire group.
**Pre-program

CODE

| | | | |
|---|---|---|---|
| GE: | General education students not yet in a program | MRT: | Medical R |
| OTA: | Occupational Therapy Assistant | MLT: | Medical L |
| PTA: | Physical Therapy Assistant | RT: | Respirator |
| S: | Sophomore | | |

TABLE 1

used at St. Mary's Junior College both in the general education and program courses. Simula-
at resemble as much as possible the actual clinical situation. Simulation might include practice
l interactions, etc. Simulations would be used to strengthen the clinical or application aspects
quences of using this teaching-learning technique. Please indicate by checking whether you would

PROPORTION OF STUDENTS WHO WOULD LIKE* (IN PERCENT)

| OTA | | PTA | | MRT | | MLT | | RT | | CDT | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N32 | N26 | N26 | N22 | N14 | N15 | N27 | M20 | N38 | N20 | N32 | N25 | N157 | N141 |
| F | S | F | S | F | S | F | S | F | S | F | S | F | S |
| 97 | 88 | 85 | 100 | 79 | 80 | 93 | 90 | 92 | 75 | 84 | 76 | 87 | 87 |
| 97 | 92 | 81 | 100 | 93 | 87 | 96 | 95 | 92 | 85 | 97 | 76 | 96 | 91 |
| 50 | 54 | 50 | 41 | 54 | 67 | 59 | 65 | 39 | 50 | 41 | 56 | 30 | 33 |
| 38 | 35 | 12 | 27 | 71 | 33 | 44 | 35 | 39 | 55 | 31 | 40 | 18 | 09 |
| 66 | 85 | 73 | 82 | 86 | 80 | 96 | 100 | 71 | 75 | 88 | 68 | 78 | 81 |

*Proportion of those responding; however, this is either the entire class or almost the entire group.

**Pre-program

| | |
|---|---|
| MRT: | Medical Records Technician |
| MLT: | Medical Laboratory Technician |
| RT: | Respiratory Technician |
| CDT: | Child Development Technician |
| N: | Nursing (RN Program) |
| F: | Freshman |

TABLE

Question

Now assume that you are just selecting a college to come to and are conside
approaches listed below are used extensively at St. Mary's Junior College a
encourage you, discourage you, or make no difference to you in selecting St

Approach C. Use of simulation in both general education and program cours

| | WOULD ENCOURAGE ME TO COME | | | | | | | | WOULD DISCO | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | GE | OTA | PTA | MRT | MLT | RT | CDT | N | GE | OTA | PTA |
| Freshman | 68 | 56 | 50 | 43 | 70 | 63 | 72 | 66 | 05 | 06 | 27 |
| Sophomore | -- | 62 | 55 | 60 | 75 | 60 | 48 | 63 | -- | 08 | 00 |

CODE

GE: General education students not yet in a program
OTA: Occupational Therapy Assistant
PTA: Physical Therapy Assistant

MR
ML
RT:

TABLE 2

to and are considering St. Mary's Junior College among others. Assume that all of the
's Junior College and you are aware of that. Please indicate whether these things would
you in selecting St. Mary's Junior College.

and program courses as described in Question #3.

| WOULD DISCOURAGE ME FROM COMING | | | | | | | | WOULD MAKE NO DIFFERENCE TO ME IN DECIDING | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GE | OTA | PTA | MRT | MLT | RT | CDT | N | GE | OTA | PTA | MRT | MLT | RT | CDT | N |
| 05 | 06 | 27 | 07 | 11 | 05 | 03 | 10 | 13 | 31 | 19 | 50 | 19 | 32 | 48 | 22 |
| -- | 08 | 00 | 00 | 05 | 30 | 04 | 09 | -- | 27 | 45 | 40 | 20 | 10 | 25 | 22 |

| | | | |
|---|---|---|---|
| MRT: | Medical Records Techician | CDT: | Child Development Technician |
| MLT: | Medical Laboratory Technician | N: | Nursing (RN Program) |
| RT: | Respiratory Technician | | |

good number of them double or triple checked the "would dislike" column (not shown in Table 1) to emphasize their feelings about this possibility.

In this same college-wide survey a summary question was asked regarding the possible influence of various approaches on the student's decision to come to the institution. Responses to the portion of this item pertaining to simulation are summarized in Table 2. Generally, simulation was not viewed as a factor that would discourage students from coming to the college. It is of interest to pay particular attention to the proportions for the Medical Records Technician (MRT) program. That program makes extensive use of a college-based "simulab" to teach clinical concepts. Those students who have considerable experience with simulation saw it either as encouraging or as making no difference to them. They certainly did not view it as a negative, discouraging factor.

Several studies done in other settings support the use of simulation in clinical teaching. Abrahamson and his colleagues concluded that anesthesiology residents using "Sim-One" reached an acceptable level of professional performance in a shorter period of time and with fewer trials in the actual operating room setting then did the residents who had not previously had training on the computer-controlled manequin.(2) In quite a different area, that of training student teachers, use of simulation to deal with classroom problems as a substitute for some of the actual student teaching time was identified as being at least as effective as an equal amount of student teaching.(3)

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(2) Abrahamson, Stephen, et. al., "A Computer-Based Patient Simulator for Training Anesthesiologists," Educational Technology, Vol. IX, No. 10, October 1969, pp. 55-59.

(3) Cruickshank, Donald R., and Broadbent, Frank W., "An Investigation to Determine Effects of Simulation Training on Student Teaching Behavior," Educational Technology, Vol. IX, No. 10, October 1969, pp. 50-54.

# RELATIONSHIPS BETWEEN NURSING AND ALLIED HEALTH

Eileen Flynn, RN, Ph. D.

# INTRODUCTION

"A technician is a man who understands everything about his job except its ultimate purpose and social usefulness." (1)

Such an observation suggests that the technician is inferior to the professional. Many occupations compete for professional status for this very reason. Wilensky(2) summarized the movement from the technical to the professional level:

1. Full-time activity at a task
2. Establishment of university training
3. National professional association
4. Redefinition of the core task, so as to give the "dirty work" over to subordinates
5. Conflict between the old timers and the new men who seek to upgrade the job
6. Competition between the new occupation and neighboring ones
7. Political agitation in order to gain legal protection
8. Code of ethics

Although these steps are familiar to those in allied health and in nursing, the acceptance of new health professionals appears to depend upon two central factors: a basic body of knowledge and the ideal of service.

Professional knowledge is associated with: (3)

1. Knowledge and skill abstracted into a codified body of principles
2. Knowledge applicable to concrete problems of living
3. Acceptance by society that the knowledge can actually solve these problems
4. Acceptance by society that these problems be referred to the specific professional group
5. The profession creates, organizes and transmits the knowledge
6. The profession itself is accepted as the final arbiter in disputes over solutions in its area of competence
7. The knowledge and skills and the difficulty associated with their acquisition is great enough to be viewed as requiring highly specialized preparation formally available only through educational channels

The service orientation depends upon: (4)

1. The practitioner must decide upon the client's needs.
2. The practitioner must sacrifice and maintain ideals with regard to his profession.
3. Society believes that the profession accepts and follows these ideals.
4. The professional community sets up its own value system and guidelines.

Aspiring occupations, so dependent upon the process of gaining autonomy and the trust of society, are perceived critically by sociologists and students of the theoretical limits of professionalization. Vulnerability, says Goode, (5) in all cases has to do with dependence upon competence in the related knowledge and skill. The harm that can be done to society by unethical or incompetent work depends upon the degree of trust granted to the profession. Thus, the credentialing mechanisms in the health professions may ultimately prove to be of utmost importance to their survival.

Compounding problems in the health system today, there is a great deal of semantic confusion between the idea of a technologist and that of a professional. There is little that may be con-

considered to fit the definition of a professional. There is no single organized body of knowledge that cannot be classified as a skill; there is no organized research or independently derived literature. There is still must confusion on the subject of self-evaluation and accreditation and certainly no consensus on the licensure of the wide-ranging groups involved.

The controversial nature of arguments about technologists versus professionals plagues the health professions. Because of increased consumer awareness of the desirable nature of health services, it is incumbent upon the provider to develop a sense of purpose and the social implications of the system associated with its educational programs, be they technical or professional. Health care planning and the social structure that supports it should be dependent upon the consumer-provider perceptions of needs, issues, and effectiveness. Thus, it is important for educators within the health care system to convey an understanding of the significance of relevant issues, problems, and alternatives to their students within the context of change. Communication among the educators within the infrastructure of the health care system would serve many purposes, not the least of which would be collaboration and mutual understanding of the roles of all members of the health team.

Dialogues about roles, be they technical or professional, must be encouraged at existing interfaces. According to Webster,(6) an interface is a surface forming a common boundary of two bodies, spaces, or phases. Systems theorists regard an interface as an interactive area associated with feedback and change. For the purpose of considering the nature and degree of relationships between two groups, it is suggested that the more dynamic definition of the systems theorists be adopted. As to the characteristics of the interface, deliberate study should reveal whether it is one that is closed or open, permeable or non-permeable. Due to the numerous roles associated with allied health, it is difficult to predict what the outcome of many may be. The future of nursing, as it is traditionally viewed and as it is experiencing expansion, may also only be speculated upon.

The commonalities and differences between nursing and allied health occurring at their interface are not clearly discernible. There is a need to define the underlying factors related to this. Use of the approach taken by Chin and O'Brien (7) for the development of an intersystem model is one technique that might be used. The major points in their approach are:

1. Conceptually isolate the system boundaries and equilibrium factors
2. Study the actual operation and output of existing arrangements

3. Formulate the objectives and define what is to be achieved
4. Introduce an extrapolation of time into the magnitude and scope of the problem that is being managed by the system
5. Examine the alternative relationships of input to output in terms of feasibility and acceptability of the contemplated alternatives and their relationship to the exicting state of the system
6. Work through the various other issues and problems involved in implementation and decision making

Since there is an obvious relationship between group process and individual responsibility in the health professions, it is important that we differentiate between group task roles and group building and maintenance roles. By doing this, it may be possible to differentiate the learning process from the behavioral aspects of role enactment: (8)

1. Group tasks are directed to the selection, definition, and solution of a problem (e.g., information seeking, coordinating, and energizing).
2. Group building and maintenance roles are oriented toward motivation and effective interaction (e.g., encouraging, harmonizing, and setting standards).

It is also relevant to note that new labels and titles require administrative support and interpretation. As new roles are introduced into an organization or system, the false expectations and suspicions of others are frequently associated with negative attitudes and resentment. The confusion and lack of understanding of the roles of new health care personnel may, in fact, be attributed to poor, even weak, administrative support. Communications, compatibility of roles, and evaluation to the acquisition of an innovative role is crucial to its successful introduction, effective implementation, and ultimate acceptance.

In summary, the relationships (or lack of them) between nursing and allied health training programs underscore the need for an organized approach to future planning for new roles. The development of intersystem models are seen as a possible means to this end. It is noted that the problems associated with communications, role acquisition, and compatibility of learned roles appear to be in need of more elaborate delineation as the system is undergoing redefinition. Administrative support of new roles is regarded as of primary importance during periods of change.

## EDUCATION FOR THE HEALTH CARE SYSTEM

The health system involves performance of specific activities, skills, and behaviors dependent upon a particular, yet evolving, body of knowledge. Activities are carried out for the achievement of the optimum level of health of the client/patient. The result of recent and increasing patient awareness of his role in the health system has been the gradual removal of barriers between the patient and those serving him. Although much of this phenomenon is related to information media, it cannot be denied that public laws enacted by the 89th Congress reflect the national concern for involvement in health care planning.*

Today, we discern the signs and symptoms of emerging interfaces in the SASHEP report,(9) the Yale Medical School commentaries on the "Physician's Assistant Today and Tomorrow," (10) and the California "Study Commission on the Nurse Practitioner and Physician's Assistant." These developments are meeting with increased interest on the part of health system members. To the end of identifying a "core curriculum" for the students in the health "provider" group, a study (11) was undertaken by the Department

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*CHP:PL 89-749
RMP:PL 89-239

of Health, Education, and Welfare in 1972. Recognition of common problems associated with preparation of "health manpower" is in its infancy, but shared learning experiences are being planned for the providers of tomorrow. Zweifler and Corey (12) noted that efforts to improve the interal operation of the health care team have not been notable to date. Inadequate coordination of education has resulted in a limited and fragmented perception of the needs of patients. One pilot study, (13) however, revealed that a team training program helped some students to understand the patient and his life style, while the patient became more aware of the ways to use the health system. Further study of the current and pressing problem of identity that pervades the health industry may be facilitated by the statements of purpose found in the following table:

## Purposes of Roles in the Health System

Diagnostics, through physical examinations, development testing, and radiological, hematological, and other body systems analyses performed by specialists in specific areas

Data Collection, through organized record keeping (on hard copy and computers) by all the above team members including the medical record librarian

Care Giving, through problem solving and decision making using therapeutic and rehabilitation modalities provided by nurses, physical therapists, occupational therapists, and dietitians

The care-giving function often is superimposed upon a diagnostic function when a new or as yet undiscovered problem is identified. Some diagnostic functions are performed simultaneously with care giving when a modality must be modified as a result of observation, palpation, percussion, auscultation, muscle testing, or discussion with the patient. For example, if a given individual appears to be overdosed, the nurse who has a standing order to give a medication will withhold it, report it, and communicate his or her data to the record as well as to the physician. Another example of the nature of the diagnostic function as it may be superimposed upon care giving occurs as the physical therapist may intervene in a therapy plan in order to provide the patient with an opportunity to maximize his ability to carry out one of the activities of daily living. Once again his progress or lack of it will be documented. Utlimately, a record is built up that must be consolidated; the essential features must be brought together into a "data base," which will, in the not too distant future, be reduced to a computer language by a medical programmer. (The implications for the use of the problem-oriented record are receiving more attention as the health professionals become more aware of the almost infinite capability of computer technology.)

A recent study for the Southern Regional Educational Board* suggests that academic institutions begin to establish an ordered list of priorities for the preparation of health care personnel. It is interesting to note that, as of this writing, there have been two reports prepared for allied health and yet another on nursing. These papers reflect the concern for identity, future needs (if not prescience), and the desires of consumers for better care The relationships between nursing and allied health could be viewed as potential and real problem areas as we consider the following activities ongoing in the health system (industry) today:

1. Reorganization of care through extended roles, shared decision making, and delegation of responsibility by physicians
2. Regionalization of programs to meet health care system needs, with possible consortia, quality controls, and collaborative credentialing
3. Establishment of schools of health services as academic institutions assuming primary responsibility for education of health manpower
4. Delineation of technical roles to be achieved through enrollment in community colleges

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*Drafts provided by Office of Kenneth Penrod, Ph.D., Vice Chancellor for Health Affairs, State University System of Florida (by Joseph Hamburg, M.D. and Darrell Mase, Ph.D.).

5. Clarification of the technological role at the baccalaureate level
6. Preparation of administrators, researchers, and faculty in higher degree programs, with concomitant professional role identification

All health professionals are concerned about the changes in equipment available to them for use in diagnostics, in therapies, and even in data collection. For example, the autoanalyzer must be calibrated frequently for accuracy of output of results, and the computer interface between this laboratory tool and the user (physician, laboratory technologist, nurse, physical therapist) must be defined, considered, and made workable. Social changes must come about if consumers are to accept the nurse functioning as a health educator in the office of the dentist. Most of these kinds of concerns are dealt with through continuing education and gradually become a part of the core curriculum materials in various courses or programs offered to beginning health professionals. There is no "terminal program" and, because of this, there must be specific support to these considerations.

Because of the need for research, it is relevant to this monograph to note that nursing research is growing, that a journal entitled "Nursing Research" contains many articles of an interdisciplinary nature, and that, in fact, nursing regards many of its problems as interdisciplinary. No allied health research activities are reported to date. It appears once again that sharing of activities such as research between nursing and allied health must be conducted and encouraged at a level beyond territoriality and with the concerns for improved patient care assuming the highest priority.

In addition, relationships between and among the health care provider groups would be facilitated if funding were made available and if programs were not duplicated. A clearinghouse for a state or a region would be one way to forestall further overlap.

Upward mobility within the health system has been associated with conflict due to the rigidity of credentialing and licensure interpretations. Custom and usage have resulted in a rejection of certain new health professionals, the limited extension of the activities of others, and loss of promising candidates. It is suggested by some that the community college and technical high schools, should be the focus for the newer categories of health workers, while baccalaureate settings providde for collaborative higher education programs for more established fields. Another view is taken by Montag in Education of the Nursing Technician.(14) Montag was among the first to address herself to the differing levels in health manpower and the use of community college education.

Since the community college began to prepare a first-level nurse, the education of this person became a prototype for other health manpower models. The fact that this new approach was introduced in 1957 implicates the health professions for lack of vision in terms of the credentialing and licensure practices of 16 years ago. Today, all registered nurses regardless of their educational background claim the same "licensure" because, in effect, they take the same examination (National State Board Test Pool). Baccalaureate education, however, provides for entrance to the field of community health, which the community college does not. Because of limited field experiences, graduates are often ill-prepared for employment in health agencies and require extensive inservice education for the first six to ten months in their first positions. Thus, although the traditional hospital-sponsored "training" programs are nearly a thing of the past, many health system employers seek a restoration of that "service-oriented" model. If it were to extend to public health, this might be an alternative, according to some writers.

The parallel between the evolution of nursing education from the Nightingale model of "on-the-job" training to collegiate education and the "on-the-job" training of laboratory, respiratory, and other allied health personnel is giving way to collegiate preparation. Social workers, occupational therapists, and nutritionists appear to have compromised in different ways. Whereas the social worker, in particular, is regarded as a Master's degree recipient, there are numerous levels of social workers who possess a high school diploma, undergo a two-to six-months' on-the-job training program in social work skills, interpersonal relationships, and comprehensive nursing care, and serve as a liaison between the health agency and the family. His increasing visibility suggests that he too should be prepared within the context of the community college or baccalaureate setting.

Although some degree of relationship between nursing and allied health seems to be surfacing, the nature of the linkages, boundaries, and barriers to communication are not clear. Yet the implications of their dependence upon each other as co-existing subsystems suggest that they must work together to achieve co-operative interrelationships.

In order to better understand the nature of training programs that lead to the associate degree, the baccalaureate degree, or a diploma in nursing and ultimately the licensure as a registered nurse, it must be kept in mind that a biophysical and psychosocial science base is provided for all students. Although some study these sciences under the auspices of a hospital while others pursue them in university of colleges, the assumption is that all will derive a similar level of knowledge in order to solve care giving problems and to derive a basis for decision making through data analysis. Beyond this, the student is taught a series of courses that usually combine several topic areas referred to as medical-surgical nursing, maternal and child health nursing, psychiatric nursing, and public or community health nursing.

It is important to keep in mind that a number of cognitive, affective, and psychomotor skills are learned at an increasing level of complexity in all programs. These proceed from the simpler kinds of activities, such as giving injections, to the more complex responsibilities of interpreting responses to therapies and planning and executing appropriate interventions.

Thus, it is clear that training for the health services is educational in intent and professional in nature since it involves increasing levels of responsibility for outcomes of individual actions performed for the benefit of individuals and groups.

In view of the clinical focus of the study under which this monograph was commissioned, it is important to bear in mind that health care students learn much of their role in the provision of direct care to patients in a variety of settings. Since they have a range of "laboratory" hours during their clinical experiences, they have what is described as adequate patient contact during their programs. When they are working with their patients, they have an instructor from their program with them in varying ratios. They are expected to become acquainted with the setting, communicate with the one or more patients, and plan a series of actions that are based upon data obtained from chats, observations, and other personnel who have been involved with the patient care in the setting. A limited amount of so-called "leadership" skills are also commonly developed by the student. These activities often involve personnel management on a patient care unit. At this point, the student may have some discussions with unit manager students if they are also in the setting. Occasional communications may be necessitated with respiratory therapy students if they are being "trained" in the same setting and if the students in nursing are aware of them. The fact is that, although programs of all kinds may occur in one locale, since they are conducted at different times, the students in various health programs may have no core experiences.

Since the trend for health manpower preparation is away from hospital-based programs, the didactic portion of the program may be carried out in the academic setting with ease, but the clinical portion becomes more difficult to plan. Instructors spend many hours running to and from hospitals and agencies often 10 to 20 miles from the college or university in order to be with students and to provide needed guidance and clinical instruction. Library resources, although available on campus, are often inadequate in the clinical settings when ready references are needed. Unless the clinical instructions take place in a large medical center, there is much to be desired about the clinical teaching back-up available to most students in nursing programs. Even if these programs are hospital based, the degree of commitment to the concept of education is sometimes questionable. The serious concern for the priority given to the service commitment of hospital training programs was one of the overriding reasons for the gradual phasing out of the hospital-based school.

Most health manpower programs moved from service commitment on-the-job training programs to institutions of higher learning in much the same way. The major differences between the planned learning experiences in the clinical setting seem to be the limitations of scope and flexibility of the objectives of the nursing and allied health training programs. By definition, they are all directed to the attainment of a science-based outcome, but within a much more severe constraint in terms of problem solving, decision making, and management. Some are expected to identify a problem before instituting a plan of care, while others intervene only when prior decisions were made about the use of a therapeutic modality related to the levels of care required. It is suspected that more satisfaction is associated with a planned experience where one can observe the outcome of one's involvement in a situation, whereas sharing of information without follow-up is associated with less finality about the outcome of one's actions.

The richness of the clinical experience for the health-related professions appears to lie in the fact that a particular skill or activity can be learned in depth during the laboratory experiences and that the student is more likely to be job-ready when graduated. For the nursing student, it is clear that, although the student may graduate with a degree based upon the NLN examinations and teacher-made tests and evaluation and even though this student may pass the state board examinations, the degree of uneasiness of the new graduate reflects the lack of in-depth experiences in the clinical areas. Recent attempts to rectify this situation are occurring in the internships that are being planned and developed by various employers.

An interview with a graduate of such a program revealed that she was more confident in her ability to make a "nursing diagnosis" which she could then transmit to a physician who challenged her. Because she was firm in her own decision that the patient was experiencing ventricular fibrillation, the physician acceded to her request (at 2:00 a.m.) and sent a colleague who corroborated her findings. This kind of confidence probably would not have been demonstrated by a new graduate who had not had an internship.

In summary, education in the health system is based on biophysical and psycho-social science applied to clinical problems. In nursing, care problems are usually similar regardless of whether the program is hospital based or associate or baccalaureate degree oriented. In allied health, some education programs are directed to the development of more problem-solving abilities and specific skills such as respiratory therapy. Most students in allied health receive in-depth experiences, whereas nursing students are exposed to a broad array of care situations and tend to complete their programs with limited expertise and confidence. Broadened clinical internships seem desirable both to the students in nursing and allied health and to their employers.

# PROBLEMS AND SUGGESTED SOLUTIONS

The need for a monograph on the relationship between the two groups suggests that there may be ongoing reciprocal dialogue, mutual planning, and quality controls. In fact, however, none of these activities are occurring between the nursing and allied health professions. Quite the contrary, nursing groups meet separately, plan separately, and establish voluntary controls without discussion of any note related to the allied health groups. Allied health professionals and their organizational leadership are tending to operate with little attention to the possibility of collaboration with nursing professionals. In some schools of allied health, nursing is but a program. In one school of allied health, a nurse provides the leadership and focal point. In most schools of nursing, there are no programs with an allied health orientation.

Ordering of mission, purpose, content, importance, difficulty, and reward are only some of the considerations worthy of the attention of planners in all health professions. While commonalities and differences certainly exist, motivation and ability of students should also play a part in curriculum planning. A career ladder, which could include all of the alternatives available to budding health professionals, would facilitate clearer delineation of curriculum design and foster interdisciplinary dialogue. The interests of the patient, interaction with the physician, and the academic administrators from other non-health disciplines would be more logically brought into discussions.

Training for the health professions should be discussed in terms of levels of responsibility, skill, and decision making, since these appear to be characteristics of the differences between technicians and technologists.

The differences and seeming dichotomy in education for the health professions reflect a lack of dialogue, a lack of quality of service concerns, the settings for clinical training, credentialing, and the overlapping of training programs. These problems will be discussed in the following sections.

## Problem A - Lack of Dialogue

Concern for discussions, conferences, and other means of exchanging ideas about the emergence of new programs for health professions is just beginning. Related problems appear to center and revolve around academic status, curriculum development, and team concept. Some possible collaborative efforts in the areas of curriculum development and team concept could be:

Curriculum Development

- Establishment of criteria and objectivity in program development with established priorities for overlap and proliferation of roles
- Identification of commonalities in areas such as:
  - Expanding roles
  - Needs of students for team work at the undergraduate level (pregraduation cooperative learning experiences)
- Elimination of apparent indifference of disciplines to the development of collaborative plans
- Increased perception and/or consensus on core curriculum as a forum for health team learning experiences
- Clarification of purposes of upper and lower division levels of experiences to be derived in learning environments:
  - Allied health
  - Nursing

- Use of clinical laboratories for planned group learning experiences
- Clear-cut interpretations and comparability of terminology relative to training, practicums, didactics, work study programs, laboratory, credit hours, equivalencies for life, and field or work experiences

Team Concept

- Elmination of covert and overt jurisdictional disputes in areas related to patient care, particularly among those in:
  - Nursing
  - Occupational therapy
  - Respiratory therapy
  - Physical therapy
  - Dietetics
- Special attention to such areas as:
  - Continuity of problem-oriented records
  - Potential of consumer involvement (as a team member)
  - Recognition of emerging new professions added to the team
  - Uncertainty of requirements for future programs

- Public interest or perception of the health team
- Sharing of:
    - Qualified faculty
    - Research activities
    - Curriculum designs
    - Evaluation and testing methods
- Establishment of a clearinghouse on health manpower program planning
- Development of a rationale for upper and lower limits of numbers and types of services
- Comparability of one group versus another in terms of salary, role, and upward career mobility

## Problem B - Lack of Quality of Service Concerns

Quality of services implies standardization with ongoing evaluation and/or peer review. Until very recently, standardization as defined by licensure was acceptable to the large majority of health care personnel and to the consumer. Because of increasing consumer pressure and the "expansion of roles and responsibilities," peer review and evaluation procedures have been introduced. Federal funding for Medicare has carried with it a requirement for periodic record review. The following recommendations are suggested:

- Awareness that there are alternatives for care providers (e.g. physician's assistants, pediatric nurse practitioners, nurse midwives) should be encouraged.
- Recognition that continuing education for competence in the application of new knowledge and the use of new technologies is the responsibility of the health professions themselves rather than drug companies and other merchandising endeavors.
- Proliferation of students requires expansion of facilities both on and off campuses and an upgrading of faculty and administrators, all of which have implications for long-range planning.
- Consumerism in the health care system should be encouraged with more give-and-take between the providers and the recipients of care.
- Decreased interest on the part of educated nurses and allied health personnel in the task-oriented hospital is associated with the concomitant exodus of qualified personnel from these institutions. Their replacement by less prepared individuals suggests a trend that should be monitored carefully to maintain minimum standards of care.

- Advanced entry into training programs in nursing and allied health should be facilitated.
- Difference between professionals, technologists, and technicians should be clarified.
- More positive views of allied health training by nurse educators should be encouraged.
- More positive views of nursing education by allied health educators should also be encouraged.
- General education should be approached by allied health and nursing from a similar or comparable frame of reference.

## Problem C - Settings for Clinical Training

The numerous areas of overlap in sponsorship of training programs make it difficult to distinguish the particular characteristics of nursing education from allied health education beyond the lower division. It is common to find nurses, technologists, and administrators in the same classroom at the upper division and in graduate school. It is not unusual for these personnel to "change hats" at some point. Thus, it would appear that the relationships between the two efforts at training have their greatest degree of difference at the lower division level. At this level, classes for the nursing student are managed by nursing faculty only, and classes for the respiratory therapists are provided by the respiratory therapy faculty. Here, the laboratory experiences are arranged, the socialization process begins, and the perceived work ethic is derived. Unfortunately, it is here that the feeling of territoriality among the various groups begins and mind-sets about "the other health workers" are derived.

Although the problems related to levels in nursing are not clearly stated or agreed upon within the profession itself, it is clear that the nurse today will be viable if he or she learns what is implied by the "expanded role" concept. In continuing to resist the unit manager, the battle for identity will be lost. There are few vestiges of professional nursing left in the idea of "nursing the desk," as characterized on television shows and in story books. The true role and function of the nurse is to maintain a working peer relationship with physicians who respect his or her judgment concerning decision making for patient care both within and outside the hospital. Nursing assistants (whether they are licensed vocational nurses or licensed practical nurses or aides) are capable of functioning under the supervision of registered professional nurses in the conduct of routines of therapy. The registered professional nurse, drawing upon his or her background of knowledge, theory, and research, institutes a plan of patient care that is an interpretation of a series of physician-originated instructions coupled with impressions and assessments. The registered professional nurse demonstrates a distinct quality of competence in the performance of complex skills and delegates those that the assistant is capable of carrying out. This role is the only acceptable one for an intelligent, responsible nurse.

In contrast to the management and care of patients, both in and out of hospitals, the allied health professional is concerned with more or less discrete areas of the care-giving spectrum. Many are only concerned with the diagnostic aspect of "information seeking" as a service to the physician or the nurse. Most are unaware of the differences in the responsibilities of the nurse, since they have little or no exposure to them except for the brief contacts they may have at the desk, finding a patient's room, or in the chart room looking at what "nurse A" did when the respiratory therapist was not on duty and the patient needed his IPPB. It is not yet customary for the team to discuss the totality of a care regimen, and thus the communications are limited, if not absent, in most of the health system activities.

Because of the novelty of allied health professional roles, it is common to hear hospital administratiors tell allied health professionals that nurses from training schools run by hospitals are better nurses. Since they (allied health professionals) have little basis of comparision, there is a tendency to accept such generalizations. Were they educated to consider the contribution of the nurse to the management of patient care, they would not accept such comments as gospel truth but would seek more information about the facts. A recent example of this lack of consideration of the professional nurse was provided at a training institute for allied health administrators. The "authority" on the subject of budgeting delivered a diatribe about American nurses; he insisted that only good nurses came from hospital schools and, because there were so few of them in the United States, the country imported nurses from the Philippine Islands who worked "better." No questions emanated from the audience about such issues as the economic rationale for the decision to do this or about quality of care concerns when people from another country are asked to suddently assume a great deal of responsibility for interpretation of data in a language that might be new to them and the difficulty these nurses have in receiving United States registration as nurses. Undermining of one professional health field by another within the same field appears to be yet another roadblock to the development of working relationships.

Dissimilarities in the approach to the educational process persist. Nursing students go to their laboratories each week for four to twenty hours and learn more and more about patient care and very little about their teammates. Allied health students often spend all of their time in a classroom and then go off to their laboratory, spending four to twenty hours in practice of selected activities. Total patient-centered care is not enhanced by these patterns of teaching.

A solution to this problem would be a core curriculum. A core curriculum including shared clinical experience should be developed and implemented.

Problem D - Credentialing

Training programs and the relationships between them may be more clearly understood by a perusal of the end result of the credentialing process. Controls exerted by various organizations and governmental agencies are represented by the many programs for certification and licensure. Accreditation of schools is a growing problem. Definitions of the three main categories of standardization--licensure, certification, and accreditation--are provided herein as a point of departure:

> Licensure: The process by which an agency of government grants permission to persons meeting predetermined training qualification to engage in a given occupation and/or use a particular title or grants permission to institutions to perform specific functions

Certification: The process by which a non-governmental agency or association grants recognition to an individual who has met certain predetermined qualifications specified by the agency or association

Accreditation: The process by which an agency or organization evaluates and recognizes a program of study or an institution as meeting certain predetermined qualifications or standards

Although an individual may be licensured to practice by the state, a certificate may also be given to that individual to indicate special preparation in a selected category of practice. For example, a nurse may be licensed for the practice of nursing in a state but may achieve a certificate in nurse-midwifery from the College of Nurse Midwives to practice the specialty of perinatal care and intervention similar to that of a physician obstetrician. A medical technologist may be licensed to practice through certification by the Registry of Medical Technologists and also licensed in a state. A detailed reference on these credentialing mechanisms is provided in the SASHEP report.

While it is not the intention of the author to assess the value and quality of training programs, it is essential to bear in mind that there are diverse views of the accepted means for standardization and credentialing. Some writers feel that a dead-end may be implied by licensure and that other mechanisms should be sought for the advancement of skills, leadership potential, and economic rewards. The protection of the public interest and the rights of the individual worker at some times appear to be at cross purposes in the health system, as they are in many other occupational fields. Collaboration between and among the health professions seems indicated in the areas of economic, political, and social concerns if some of the following aspects of conflict are to be solved:

1. Economic and social welfare of professional members are in conflict with public demands for health care.
2. The reputation of health professionals is considerably altered by the fragmentation that characterizes the health system.
3. Accreditation is used as a criterion measure for the disbursement of Federal and other funds, and licensure is often required for traineeships. This suggests that stricter adherence to standardization is in the best interest of society.
4. Educational institutions, potential employers of health professionals, Federal and state governments, students, and consumers comprise a constituency heretofore limited to hospitals, physicians, and educators.

The SASHEP report recommends aspects of accreditation that have implications for future interdisciplinary planning in facing the foregoing problem areas:

1. Accountability of accreditations
2. Structure of accreditation
3. Financing of accreditation
4. Expansion of accreditation
5. Research in accreditation
6. Relationship of accreditation to licensure
7. Relationship of accreditation to certification

A deeper question related to the limitation of licensure to those graduated from a voluntary accredited program has been considered. Accreditation as a criterion for state licensure raises an issue of substantial social importance of those who compiled the SASHEP report. They note that, since licensure for individual practice in a state is a government-sponsored process, it seems questionable to endorse a limitation based upon voluntary self-evaluation within a school or a program. Further, certification as a means of assuring competency, effectiveness, and professional identity would appear to have the potential for team considerations if this technique were to be encouraged. At this writing, the American Nurses Association is devising ways of providing formal recognition of personal achievement and superior performance in nursing, although the National League for Nursing is the accrediting body.

A solution to this problem would be the facilitation of change and improved relationships for training and learning experiences of both student groups through ASAHP and ANA planning of collaborative certification programs for training in selected ares of care giving, diagnostics, and information handling.

## Problem E - Overlap of Training Programs

Any discussion of the problems of training health manpower draws attention to the numerous variations on the theme. A search of the literature reveals an inconsistency and a dilution in support of training programs. Identifiable are many topics used in the process of classifying grant support given for health manpower preparation. Some examples are health personnel training, physician support personnel training, allied health personnel training, primary care health professions personnel training, nursing training, dental training, medical technology, nuclear medicine, and training for other health occupations. In addition, problem areas receiving special funding are curriculum development, vocational work study, cooperative education, training for teachers of the handicapped, college work study, educational research and development, rehabilitation, aging, maternal and child health, social security, manpower development and training, neighborhood youth corps, agricultural research (related to consumer and public health protection), and health workers in Appalachia.

Selected categories of health manpower training funded by the Department of Defense in FY 1972 ranged from medical internships through various levels of responsibility including hospital diet cook. Trainees for this period numbered 10,920 for the Army, 7,618 for the Navy, and 7,686 for the Air Force. The Federal Coal Mine Health and Safety Act of 1969 (PL 91-173) and the Federal Metal and Nonmetallic Safety Act (PL 89-577) resulted in experimental first aid and safety demonstration programs in Colorado and West Virgina. Emergency medical treatment training was also funded by a Bureau of Mines in-house program. Seminars in environmental health were sponsored by the Housing Act of 1964 (PL 88-560). Department of the Interior appropriations were directed to the funding of the Trust Territory School of Nursing and medical training and inservice education of health workers of the area. The Bureau of Prisons of the Department of Justice sponsored health occupations training for inmates in dental assistant and nursing assistant programs. Pysician's assistant, dental technician, medical housekeeping, x-ray technician, and hospital attendant programs were also supported under this organization.

The seeming differences between nursing and allied health appears to some extent to be related to the bureaucratic structure of the Department of Health, Education, and Welfare, which has a separate Bureau of Health Manpower Education with a division of physician and health professions education, a division of nursing, and a division of allied health. This branching in organizational planning implies a distinct difference between nursing training (PL 92-158, Title VIII, PHS, entitled the Nurse Training Act), health professions training (PL 92-157) Comprehensive Health Manpower Training Act of 1971), and allied health professions training (PL 91-208) for schools of public health providing training to dentists, health administrators, health educators, nurses, physicians, sanitarians, statisticians, and others (by PL 89-751 for Allied Health Professions Personnel Training Act).

A solution to this problem would be a clearinghouse for health manpower training.

In summary, problems associated with relationships between nursing and allied health training are underscored by the fact that it is difficult to differentiate between the roles of the technician, the technologist, and the professional. Diagnostics, data collection, and care giving emerge as the major purposes of both types of training; however, there is overlap and interrelationship between and among the three areas. The nature of the changes in the health system imply greater recognition of the emerging new and expanded roles of health manpower. The high degree of sophistication of applied technologies suggest that the territoriality of nursing and allied health should be reconsidered. Lack of dialogue, concern for quality controls, the settings for clinical training credentialing, and the overlap of roles within specific training milieus suggest that an organized planning process be instituted.

## CONCLUSION

Education for the health occupations should continue to change and improve. Although the emphasis within a given program will be to meet the objectives of the program and the role for which the student is being prepared, the physical, biological, and socio-behavioral sciences will continue to form the base for health science education. The system of health manpower education will need to be associated with:

- Increased flexibility
- Additional cooperative and collaborative learning experiences
- Broader bases of support
- Increased emphasis on evaluation and research

Flexibility will be enhanced by recruitment from all sectors of society, provision for career mobility on a ladder and a lattice concept, and recognition of the life experiences, knowledge, and skills students bring with them. In addition, development of core curriculum based on evolving needs, changing conditions, diverse learning environment, independent study, electives, and early concentration for specialized interests will increase flexibility.

Cooperation and collaboration will be facilitated by interdisciplinary planning, shared learning experiences, collaboration among all health personnel in practice areas, and involvement of health sciences students in curriculum development.

Increased support should be derived from community planning groups, financially solvent and/or interested citizens, and public information services.

Evaluation and research in health science education should be increasingly emphasized. Research and evaluation should be conducted by qualified health team analysts, on a collaborative basis, with a view to the interpretation of data and applications of findings where relevant. (See Appendix).

Perhaps Schlotfeldt (15) has said it all in a paper on critical analysis of the career ladder concept. According to her, there are three possible interpretations of the term "career ladder" as it relates to the health occupations:

1. A single career ladder can be ordered on a continuum, which makes it possible for a nurse to move easily into medicine. This denies the existence of determinants of career choices for nursing, dentistry, and medicine.

2. Different occupations have unique and distinguishing characteristics and, when pursued, require a single-track approach. The differences in motivation and abilities are exemplified by persons seeking preparation for different careers within any field of work, acknowledging that some knowledges and skills are shared by all.

3. Different careers are equally important and differ from each other in relation to native ability and the content required and offer several different career ladders within each health occupation. Inherent in this interpretation is that there are basic differences between professionals, technicians, and assistants, although some knowledge and skill are shared by all.

Failure to delineate the goals and functions of nursing assistants and technicians has resulted in misunderstanding of "nurse manpower" and has led to misconceptions of "barriers" to educational opportunities in nursing. This may well be true of allied health manpower programs of the future. Thus, it is urgent that rational decision making be pursued on an interdisciplinary basis. One can only select the second interpretation offered by Schlotfeldt to promote improved dialogue, quality control, and credentialing, to diminish unnecessary duplication, and to improve the use of patient care settings for training.

Collaboration for program evaluation would reveal many of the discrepancies that presently exist in the relationships between training programs for nursing and programs for allied health manpower. Probable outcomes would be redefinition of roles, improved attitudes toward health care workers on the part of the public, and more economic use of health personnel. Another distinct probability would be a clarification of the now irritating fact that physicians view their role as one of dictating to the health care workers, prepared at the college level, when in fact they should be collaborating with these individuals as associates.

Since it is clear that a relationship between nursing and allied health cannot be reached in one step, a series of workshops and seminars should be instituted that would be directed to the issues identified throughout this monograph. It is suggested that, as opposed to unilateral planning for articulation of lower and upper division curriculum (for example), a multidisciplinary approach to articulation be instituted toward the development of curriculum, career ladders, and career mobility. Team teaching could also be considered under this topic area.

Under the pressures of a crisis-oriented health care system, it is difficult to plan realistically. Because of the awareness of some alternatives, however, it may be expected that viable approaches will be welcomed. Resistance to change can only be overcome if a systematic, organized approach is taken, such as the model proposed by Chin and O'Brien.

The future of the relationships between nursing and allied health appears to depend upon the fact that both workers are middle-level health workers attempting to improve patient care and thus have a common cause, and thus it seems only natural that training programs develop core courses to this end. The process of mutual recognition, respect, and decision making, although slow and often tentative, seems to be advancing. Few immediate or dramatic breakthroughs in communications may be anticipated in the near future.

The traditional areas of nursing, occupational therapy, and physical therapy appear to continue to maintain some mutual interdependence. The allied health workers who appear to be less aware of the potential of developing working relationships with nursing are those in medical technology, radiation therapy, and respiratory therapy. Solutions to the underlying difficulties are planned learning experiences such as "Kentucky January," (16) which was directed toward answering some of the following questions:

1. What is a team?
2. What is a health care team?
3. What are health care team skills?
4. How are they articulated?
5. What are the interdisciplinary frictions that will arise, and how will they be resolved?

Formalization of interchange and interaction between the ANA and the ASAHP might also be fruitful. With the increasing sophistication of knowledge related to health care, it seems only logical to assume that nursing and allied health should form a partnership. Since nurses and allied health workers are regarded as second class citizens by the medical community, it would appear that they have the potential for a natural alliance. With the changing health care system emerging as a major force in society, students must be taught to relate responsibility to each other and to patients. Awareness of the multi-variants affecting health care delivery will only develop if the team learns together.

In summary, since increased flexibility, collaboration, and evaluation appear to be associated with the future development and success of health manpower training, it is likely that role redefinition will depend upon continued awareness of the need for cooperative planning. Alternatives to the present pattern of unilateral program planning are workshops, seminars, and multidisciplinary approaches to health manpower training. The crisis-oriented health system must be redirected to overcome an inherent resistance to change. Systematic, organized approaches must be conceptualized.

# FOOTNOTES

1. Glasser, Melvin, "Consumer Expectations of Health Services," in Corey, L.S., et. al., Medicine in a Changing Society, St. Louis, C.V. Mosby Co., 1972, p. 38. (Quote from Sir R. Livingston, late Chancellor of Oxford University)

2. Wilensky, Harold, "The Professionalization of Everyone," American Journal of Sociology, Vol. 70, September 1964, pp. 142-146.

3. Good, W., "The Theoretical Limits of Professionalization," in Etzioni, Amitai, The Semi-Professions and Their Organization, N.Y., The Free Press, 1969, p. 295.

4. Ibid., p. 277.

5. Ibid., p. 275.

6. Webster's Seventh New Collegiate Dictionary, Springfield, Massachusetts, G. & C. Merriam Company, 1967, p. 441.

7. Chin, Robert, and O'Brien, Gregory L., "General Intersystem Model," in Systems and Medical Care, Cambridge, MIT Press, 1970, pp. 173-175.

8. Likert, Rensis, New Patterns of Management, N.Y., McGraw-Hill, 1961, pp. 173-175.

9. Commission Report, Study of Accredition of Selected Health Education Programs, SASHEP, One Dupont Circle, Washington, D.C., 20006.

10. Sadler, Alfred M., et. al,, The Physician's Assistant Today and Tomorrow, New Haven, Connecticut, Yale University School of Medicine, 1972.

11. Burnett, Carol, Report on Core Curriculum in Health Professions, Washington, D.C., Department of Health, Education, and Welfare, 1972.

12. Zweifler, Andrew J., and Corey, Lawrence, "Physician Manpower and the Health Care Team," in Corey L.S., et. al., Medicine in a Changing Society, St. Louis, C.V. Mosby Co., 1972, p. 124.

7. HOW MANY PROGRAMS ARE OFFERED EACH YEAR?____________

8. HOW IS THE PROGRAM FUNDED?__________________________

9. IS THERE STUDENT TUITION?___________________________

10. HOW MANY APPLICANTS WERE THERE IN THE CURRENT CLASS?

____________________________________________________

HOW MANY WERE ACCEPTED?______________________________

11. LENGTH OF PRESENT PROGRAM_______(weeks/months/years)

12. EMPLOYMENT OPPORTUNITIES FOR APPLICANTS

PRIOR TO ATTENDANCE______________________________

FOLLOWING PROGRAM COMPLETION_____________________

OTHER CONDITIONS__________________________________

What % time is spent in clinical practice in these settings?

Clinic or office _____%

Home visit _____%

In hospital _____%

What clinical activities are emphasized during each quarter of the program?

| First Quarter<br>(length in months______) | Second Quarter<br>(length in months______) |
|---|---|
| | |
| **Third Quarter**<br>**(length in months______)** | **Fourth Quarter**<br>**(length in months______)** |
| | |

Describe the following features of the program in narrative form. If prepared materials are available for a given item, organize the material under the item heading.

A. Program Goals and Expected Outcomes

B. Program Philosophy (include expected role, setting and responsibility of graduates)

C. Requirements and Procedures for Admission (include selection criteria and recruitment)

D. Learning Resources provided (include library facilities, special simulation models, etc.)

E. Student Services (include, if available, health counseling and financial aid)

F. Clinical facilities used for clinical observation and practice

G. Preceptor orientation for role and responsibilities in program

H. Methods used to adjust program to meet needs of individual students

I. Means of assuring transition of program content from theory to practice

J. Specific criteria used to judge whether student completes program

K. Methods of evaluating program

L. Orientation and guidance for employers

M. Placement activities for graduates

N. Follow-up activities with respect to graduates (include reports, studies, statistics - attach if available or indicate where available)